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PRINTOUT
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JULY 1983 95p
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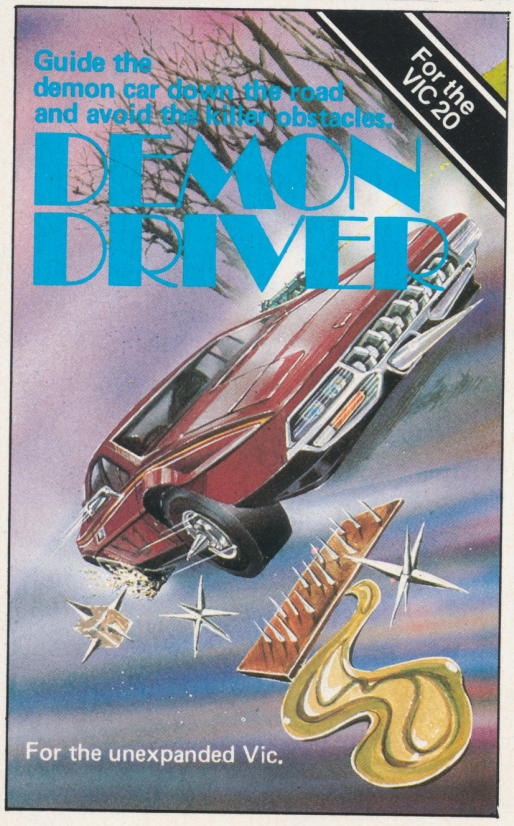

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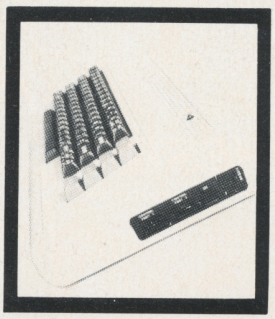

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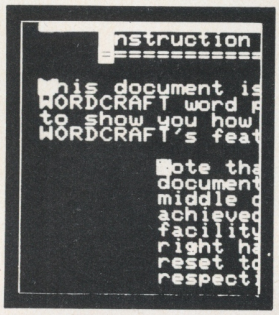

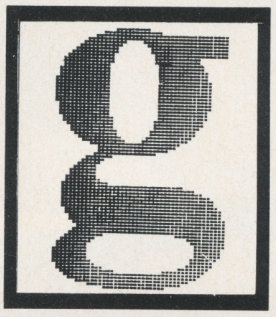

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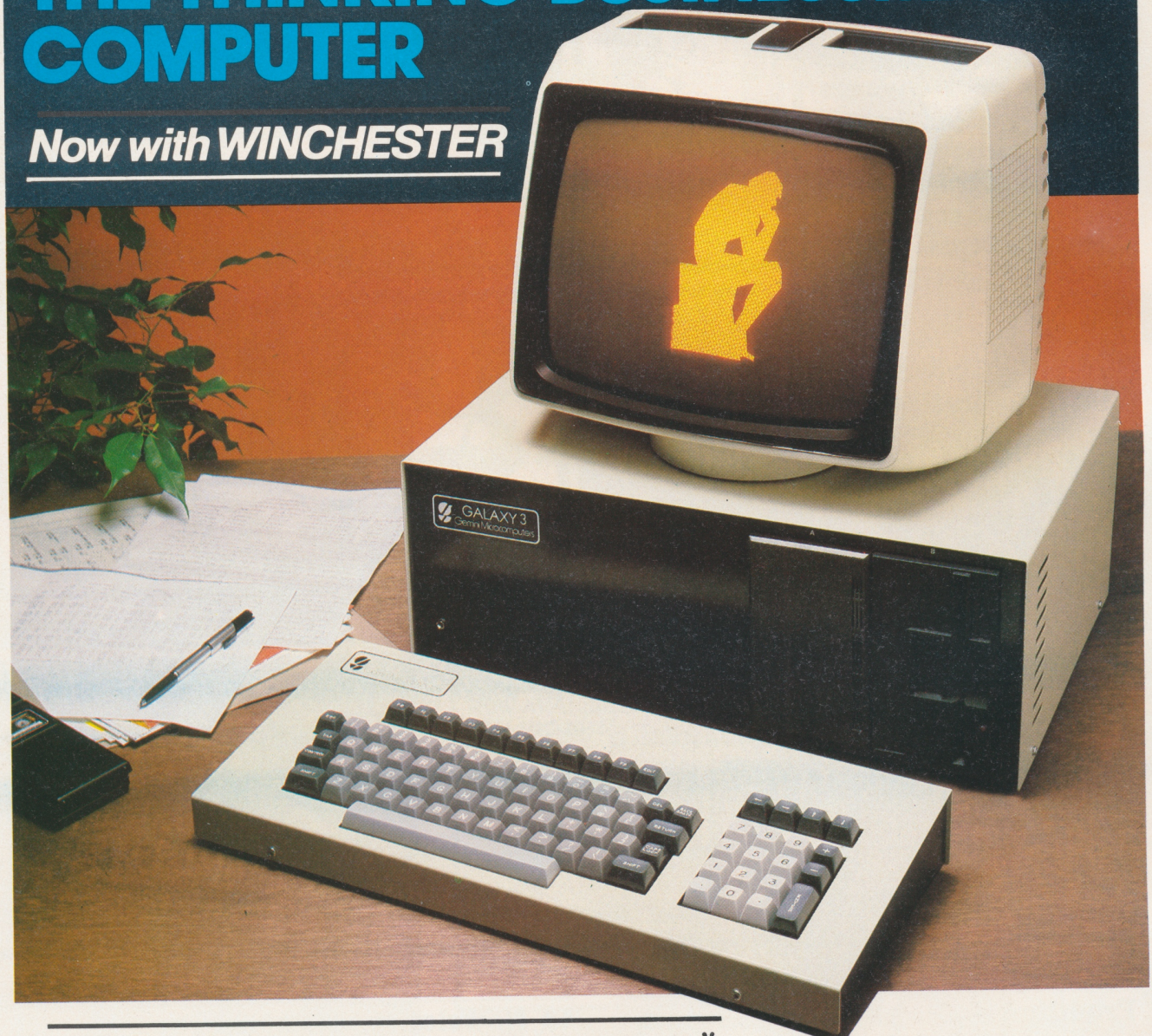
THE THINKING BUSINESSMANS' COMPUTER

Now with WINCHESTER



A complete computer system, with a 5.4 megabyte Winchester Drive for only **£2,500***

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FRONTLINE

Learning v. Teaching

English was my worst subject at school – I very nearly failed the O-Level, and would opt for anything in preference to writing an essay. Now while there are those who would argue (notably amongst my loyal and deferential colleagues) that I still can't write, and I certainly admit to chronic spelling, I am nevertheless now in a job for which I am primarily paid to create and manipulate English text – and I thoroughly enjoy it.

That makes me one of the lucky ones: at an early age all of us are branded by our educational system and left in no doubt as to what we are 'good' and 'bad' at, and indeed what *kind* of a person we are – a psychological restraint which few adults ever break through.

The most common one is a fear of mathematics. Anyone who works with computers encounters this everytime they introduce themselves at social gatherings – "Oh, computers!" comes the rejoinder, "You should talk to my brother/nephew/son – I just haven't got a mathematical/logical/that sort of mind". But this is merely symptomatic of a more endemic disease – the fear of *learning*.

I'm afraid that I believe it is our educational system that is to blame. After school I spent three years studying Engineering at University, yet I can remember less than 5% of the content. True, we had some interesting laboratory and project sessions, but the majority of our time was spent just copying down notes from the blackboard. In short, the subject was being *taught* rather than *learned*.

Our cover this month depicts the Turtle – a kind of mini-robot that draws graphical designs, but which according to its creators is really a device 'for thinking with'. It forms part of the LOGO system, which uses computers to create an environment in which children can learn traditionally academic disciplines such as Maths or Physics or Music, in the same natural way in which they learn to walk and talk.

LOGO presents a very obvious threat to our existing educational system. So whether or not you agree with the conclusions of our feature, LOGO is a subject that you can't afford to ignore.

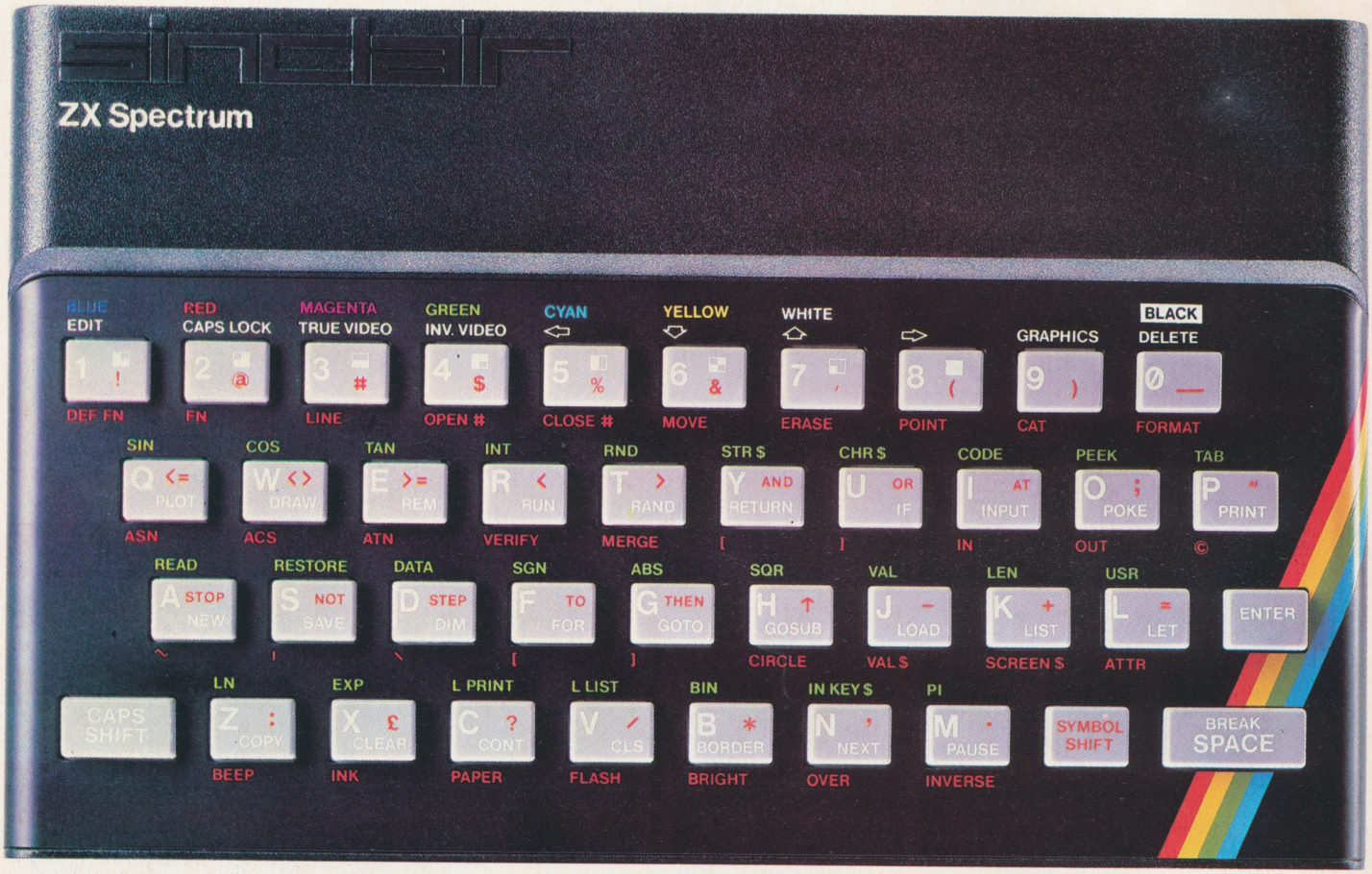
If I seem a little evangelistic on this subject, it is because I believe in LOGO – not as some kind of universal panacea, but at least as a step in the right direction. To put it into some kind of context, I am currently a 24-year old bachelor (*You should get charged for that kind of advertising – Chris*), but I would hope that by the time my future progenies reach schooling age, the educational authorities will have corrected some of the glaring deficiencies which LOGO exposes.

P.S.

Next month we shall be looking at the vast range of portable business microcomputers that have recently appeared on the scene, as well as the way in which many software houses are designing programs that can be operated with a 'mouse' device.

Richard Pawson – Editor

Sinclair ZX Spectr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RED CAPS LOCK
MAGENTA TRUE VIDEO
GREEN INV. VIDEO
CYAN
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WHITE
GRAPHICS
BLACK DELETE
DEF FN
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LINE
OPEN #
CLOSE #
MOVE
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FORMAT
SIN COS TAN INT RND STR $ CHR $ CODE PEEK TAB
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LN EXP L PRINT L LIST BIN IN KEY $ PI
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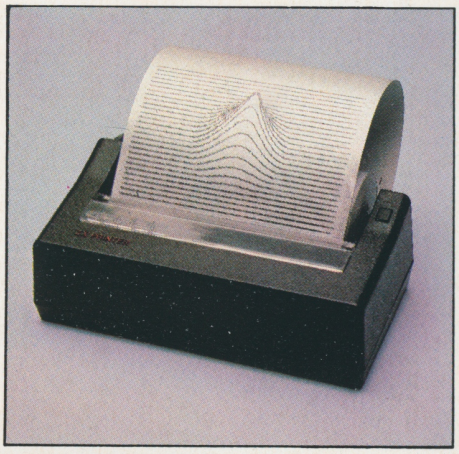

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It's hard to know which set of figures is more attractive. Certainly the ATARI 800™ Computer, upgraded by an astonishing 32K without any increase in price, will have its admirers.

However, £40 off the ATARI 400™ Computer makes it remarkable value for money, particularly when you take into account its 16K RAM (on some computers you'll be charged extra to upgrade to 16K).

It's even more remarkable when you look at our computers feature by feature.

The Family Computer.

Before we designed them, we thought about who was actually going to use them.

One day our computers might be playing games; next, they're wrestling with household budgets; teaching geography to an 8-year-old; or printing letters.

In other words, we designed our computers and software for as many applications as a family has ideas. (Now the ATARI 800 Computer has 48K RAM, there's even more memory for even more applications.)

Next we built in high-resolution graphics. Inside our computers, we have a microprocessor whose only job is to operate our graphics.

(All told, you can choose up to 16 different colours in 16 intensities, which gives you a spectrum of 256 different shades.)

In fact, our computers divide the screen up into 60,000 tiny points, each one of which can be changed without affecting the other.

A friend not a fiend.

We also looked at ways to make computers rather friendlier.

On the ATARI 400 Computer, we've incorporated touch-sensitive keys with ridges, so fingers won't slip; on the ATARI 800 Computer, we have keys much as you'd find on a standard typewriter.

You can talk to your computer in a choice of languages (five for the Atari 400, nine for the Atari 800), including ATARI BASIC, using software which you load in on cartridge, cassette, or disk.

For our computers, we have one of the largest software libraries in the world: everything from speech synthesis to sophisticated data management.

No doubt you know all about our famous games such as PAC-MAN†, SPACE INVADERS† and STAR RAIDERS,™ winner of the 1982 Game of the Year Award.

However, we also boast home and office application software as well as educational programs to satisfy the most enquiring mind.

You can learn French, Spanish, German or Italian on our computers and through our unique 'sound through' system you'll hear the language and learn it the way you learnt your mother tongue. (Other computers will leave you speechless.)

You can teach yourself touch typing, compose and play your own music or teach a child the alphabet.

On another program you can find out if your current mortgage is giving you the best value for money; while yet another program will answer a question that has vexed mankind for generations: "Where does all my money go?"

At the same time, the outstanding VisiCalc* program is available for the ATARI 800 Computer.

Write your own programs.

As if all that isn't enough, through Atari's Program Exchange (APX), you can have access to a wide range of the most imaginative programs written by our users.

Or you can learn to write your own programs with the help of our 'Invitation to Programming'™ series, using our unique 'sound through' system.

Surprisingly, you won't have to plough through a small library of manuals to do so, since most of the series is on software, not in hard books. Of course, we've always had just about everything you're looking for in computers.

From today, we've got even more.

Atari 400 and 800 Home Computer Technical Specifications.

Colour Capabilities: Choose from 16 colours, and 16 intensities (up to a total of 256 shades).

Sound: Four independent sound synthesisers for musical tones and games sounds. Three and one half octaves. Variable volume and tone for each voice.

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Memory: Includes a built-in 10K Read Only Memory (ROM) Operating System with 48K Random Access Memory (ATARI 800) and 16K Random Access Memory (ATARI 400).

C.P.U.: 6502B Microprocessor 0.56 micro-second cycle. 1.8Mhz.

Special Features: Three customised integrated circuits.

Extended Graphics Functions: High-resolution graphics. Multi-coloured character set. Software screen switching. Mixed text and graphics modes.
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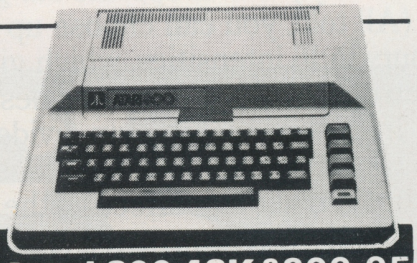
Atari 400 £149.95



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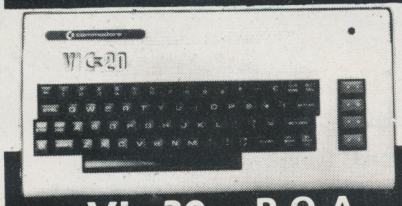

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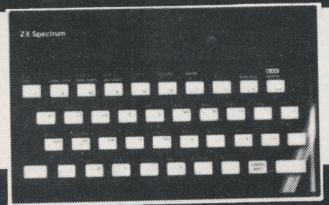

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READ WRITE

Agree or disagree with something we've written? Why not drop us a line....

EVIL SPELL

Your article on spelling correctors (*May, page 70-73)* proved something I had suspected all along about these programs... that you need to be able to spell to use them in the first place!

Once your contributor told his program (page 73) that the plural of apostrophe was apostrophies, nothing in the world is going to tell it (or him) that the correct spelling is apostrophes. Likewise occurrances (he means occurences, but his program won't superspell it for him now he's told it how *he* thinks it's spelt); and likewise unlicenced (the verb to license is, of course, spelt with an 's').

Another thing Superspell won't do is tell your contributor the subtle but crucial difference between 'it's' meaning 'it is' and 'its' possessive, thus allowing him to make the peculiarly offensive mistake of saying "Superspell is an excllent program.. that does it's job superbly".

Of course, when I was a magazine editor, I expected my contributors whether aided by spelling checkers or old-fashioned dictionaries to make mistakes like this; and I expected my sub-editors to correct them. Or have you replaced subs with spelling checker programs in your establishment?

Rod Allen
London NW3

? Out of data error – Ed.

REAL EDITOR?

Oh yes, this guy *is* for real. (*see 'Mouse in the cupboard', Read/Write, May.*) For your information, and that of your proofreaders, I will quote you the OED. That's the Oxford English Dictionary, Clarendon Press, Oxford, UK; 1933, in case you don't catch the allusion.

Stationary *adj*. Having a fixed station or place.

Stationery *sb*. 1. The articles sold by a stationer; writing materials, writing-table appurtenances, etc. 2. *attrib*. as in *stationery business, trade, ware.*

In my letter published in your May issue I was, of course, trying gently to point out that Apple's LISA whizzo software perpetrates a fourth form spelling error. For my sins, you altered the spelling *stationary* back to the form that Apple should have used in the first place, and accompanied it with a photograph showing the mistakes again, and your pithy comments. It was a joke, you see... stationary, mobile? Is there a real editor in the house?

Jonathan Richards
International Food Information Service
Wetherby

P.S We won't go into how the OED spells *disc* and *programme*, eh?

Ah! Sorry about that – me and my big mouth. Spelling never was my strong pont – a weakness which I blame on inadequate education (see this month's *Logo* feature)! I don't know what Apple will do about their stationary cupboard, but there is one good piece of news: after heavy pressure from the non-USA parts of Apple, the 'Trashcan' has been renamed as 'Wastebasket' – officially.

STREET LEGAL

I was intrigued by your *'Motorist's Guide to Micros'*, pointing out the similarities between cars and computers. It seems to me that there are equally striking parallels in the journalism of the two industries.

Clearly 'Practical Computing' and 'PCW' are the 'Motor' and 'Autocar' of the micro world. What is the equivalent of 'Practical Motorist', with its do-it-yourself rustproofing and Morris Minor clutch overhauls? Obviously, 'Computing Today'.

Across the Atlantic, 'Creative Computing' has the laid-back look and feel of 'Road & Track'. I puzzled for a long time to recall what 'Byte' reminded me of. Long-winded descriptions of projects which no one ever actually builds? Hundreds of pages of ads for weird gizmoes? Of course: 'Popular Mechanics'!

And what of your goodselves? Fine writing and wit, laced with scoops and scandal: it must be 'Car' magazine. Do any of you wear handlebar moustaches?

R.G.Taylor
Birmingham

Only when we don't want to be recognised, Mr. Taylor. We rather liked your idea of comparing computer magazines and the motoring press, though we had always seen ourselves as the Hot Rod & Custom Car!

Plans to introduce pull-out centre spreads involving twin floppies and plenty of software, however, were axed by the publisher on the grounds of bad taste.

FLIGHT OF FANCY

I thoroughly enjoyed your feature on the *Microsoft Flight Simulator*, (*MicroComputer Printout, May 1983*). What the Wright brothers accomplished for aviation you have achieved for both aviation and the citizens of Chicago. Having flown in and out of Chicago several times, the last flight being only ten days ago, I am happy to observe that the O'Hare Airport has been miraculously relocated off Lake Michigan (please see the diagram, page 86, *"Rearward view... having taken off from Chicago O'Hare"*).

Your remark, *"My own trial of the program involved taking off and landing at Chicago's O'Hare airport, and the effect of fying around the skyscraper which represents Chicago, has to be seen to be believed! (page 86),"* arouses my curiosity as to what plane you were really flying and to the level of your flying skill, speaking pilot to pilot. As I understand it the IBM PC reboots the take-off from that strip of cow pasture that is represented in your diagram on page 86, and not O'Hare. This makes me really want to see your take-offs and landings before believing.

I must agree with you though that the flight simulator is fun, as well as being educational and certainly cheaper than renting a 172. As cheap as it may be, my head remains in the clouds dreaming of the day when I may own an IBM PC and Microsoft Flight Simulator.

Peter David Lee
Sevenoaks, Kent

BAD NEWS

With regard to your article entitled *Thorn EMI's "Jumbo Jet Pilot"*, published in the *May* edition of *MicroComputer Printout.*

May I please stress that our program Jumbo Jet Pilot is only available for the Atari 400/800 computers and is *not* available for the Commodore VIC 20 or any other computer system.

I would also add that we have no plans for any future such release.

Mike Dixon
UK Sales Manager
Home Computer Software
Thorn EMI Video Ltd

MAPLIN

HARDWARE

Atari 400 with 16K RAM	(AF36P)	£199.95
Atari 400 with 48K RAM	(AF37S)	£299.00★
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All above with BASIC and handbooks		
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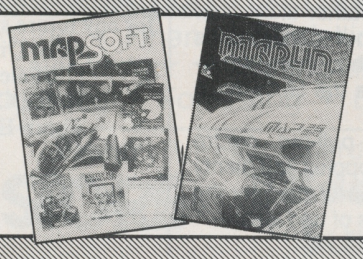

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JULIAN ALLASON'S

NEWSLETTER

A monthly round-up of news, inside stories, investigations and industry gossip, compiled exclusively for *MicroComputer Printout*.

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Microsoft

Microsoft, the name that became synonymous with the language BASIC, is now diversifying into applications software. Founder and President, Bill Gates, flew into the UK to unveil a Mouse...

Bill Gates sits at his hotel window watching the aeroplanes swoop low on their final approach to Heathrow's runway 010. A few hours ago he had been on one of them, up front in first class with his entourage and his mouse.

The mouse, arguably the most expensive rodent in Christendom, sits on the gilded roccoco coffee table, half hidden by a tent shaped card inviting guests to participate in the bar's happy hour:

"Harvey Wallbangers half price between 5.30 and 7 p.m."

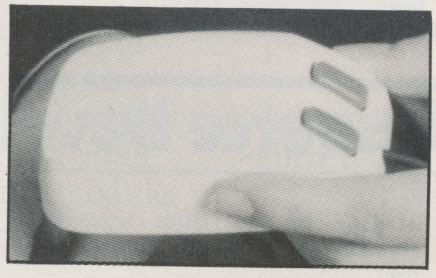
Even in the youthful world of personal computing, Gates is a prodigy. 28 years old, and looking half that, he controls a software empire that has been conservativelv valued at 250 million dollars.

But money isn't the reason he's presently enjoying the sound proofed hospitality of my Lord Forte. No sir. Master William is here to up the ante in a very rich poker game. In the pot are the reputations of four of microcomputing's most hallowed names: Apple, Digital Reseach, VisiCorp and Gates' own house, Microsoft. Names to conjure with. Indeed, names which might also be mud in a twelve-month, capitalism reserving its most withering contempt for those who, flying too close to the sun, plunge Icarus-like into the ocean's insolvent depths.

The first hand had gone to Digital Research, whose Gary Kildall had dealt himself a near full house with *CP/M*. Gates had then played the IBM card, trumping *CP/M* with his *MSDOS* operating system. But Kildall, declining to concede, had painstakingly built up his hand, bidding first Concurrent *CP/M*, then *CP/M Plus*.

In December, VisiCorp had unexpectedly staked a claim with *VisiON*, although none knew the value of their hand. Apple too had declared an interest, playing its joker, *LISA*, but retaining the *Macintosh* card up its sleeve.

Bill Gates and his furry friends.



Now Gates was growing impatient, the game lasting longer than he had expected. It was time for the grand slam.

"What can anyone else do?" he asks rhetorically. "We've got a mouse at very low cost, we've got the software, and we're going to promote the hell out of it."

It's a fair question because Microsoft have capitalised on their unique position as the world's pre-eminent supplier of BASIC to include in the mouse package software driver routines to append to the standard language, the functions and commands necessary to control the mouse.

What of the as yet unannounced mouse/graphics product from arch rivals Digital Research, then?

"What can they do? Sell a hardware mouse? Anyone can do that," grins Gates. "Or make it work on their own operating system, which might rather restrict their market to say the least..."

Downstairs the likes of Acorn, ICL and ACT were being briefed on the software implications. Their verdict: "It's a mighty mouse indeed". What makes it so is a cunning design packing sufficient gubbins inside the mouse itself to enable it to be run from the RS232 serial port present on almost every micro these days. So no special mouse traps, mouse ports, or other rodential interfaces are necessary.

Hmmm! There is no power available from RS232, so the mouse must be battery powered? "Nope," smiles Gates conspiratorially. "How it's done is our little secret and we're patenting it." Closer inspection of the RS232C spec reveals, however, that a minute amount of power *is* available from the interface. Not even enough to run an LED, but sufficient to power CMOS circuitry...

Microsoft's mouse isn't appearing in a vacuum. They are offering a new word processing package, clumsily christened *MultiTool Word*, to be released at the same time. I have to say that it is the best word processor I have ever seen, bar none. Which doesn't make explaining it any easier, because it is nothing like *Wordstar, Easiscript, Wordcraft* or any of those currently available on the micro market.

Particularly nice is that the text appears on the screen exactly as it will on paper, right justified or ragged, bold, roman or italic. For thickos like your columnist there is a context-sensitive HELP facility, and an UNDO command to recover from cockups.

Although *MultiTool Word* has been designed for use with the mouse, it runs perfectly well without. Indeed, it was noticeable that Bill himself used shortcuts – pressing the Alternate Shift key followed by B to get bold face characters up on screen, for example. "It's the classic trade-off between ease of use and efficiency, but both options are catered for," he explains.

Given Gates' well-known love affair with graphics, one surprise was the absence of the multiple window facility that

JULIAN ALLASON'S

NEWSLETTER

attracted so much attention on *LISA*. I said as much. It must have touched a raw nerve because whilst repeating the company's commitment never to pre-announce products, he promptly placed a new disk in the computer and began demonstrating a package called *Window Manager*. Shrinking, growing, overlapped windows were soon in evidence all over the screen. "You do understand that this is just a mock up...," he said with a twinkle.

When he is not thinking about software problems, what does Gates do? Judging by the telephone calls that were coming in – quite a lot of explaining. A highly agitated Steve Jobs of Apple rang to complain about not being given sufficient warning about the rival mouse's release.

"He's a good guy, Steve, but because Apple buys a lot of stuff from us, he figures he has a right to complain. But then IBM, and just about everyone else buy a lot of software from us too..."

Like so many Gatesian observations it ends with a shrug and that deceptive self-deprecating smile.

Downstairs the computer industry is shovelling as much airline type food into its face as it can, courtesy of Microsoft. "You know that guy Gates?" demands one hardware man to his companion. "He's ten million dollars richer than when I last saw him, and that was only six months ago!"

This is probably a serious under-estimate. According to my projections, Bill will be rich enough to buy the United States by 1997. ○

Microtax and mystery man

A program for home computers which helps you avoid tax – legally...

This man is Gordon McLure of Tax and Financial Planning Ltd., author of the new *Micro Tax* program.

Oh no he isn't, he is my old friend Gavin McWowser, male model and close friend of Princess Di's chiropodist.

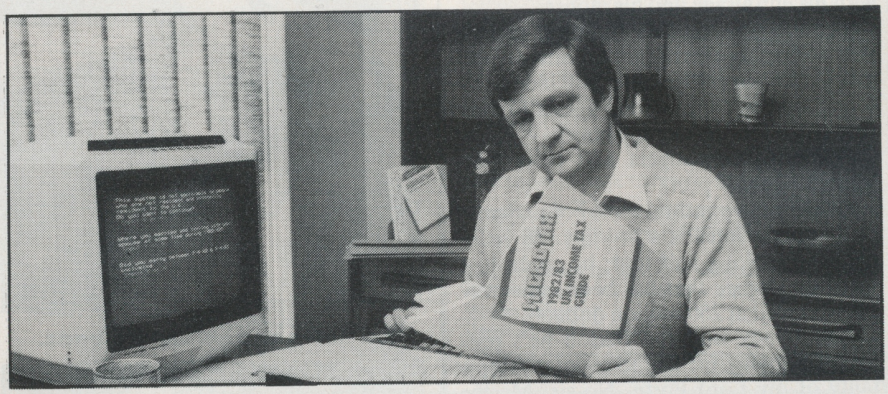
To further confuse matters, application of a magnifying glass to the Notice of Coding shown in the picture reveals the name of Master Garcia Caldwell of Woking.

So who is this mystery man? To resolve matters I telephoned the 'Media Contact' named on the back of the photograph, one Kevin Traverse Healey. At first he tells me that it is indeed Mr. Gordon McLure. Pressed on the point, however, he concedes that it might not be. In fact, he says, it is "a homely person".

Unconvinced by this explanation I send the picture to Interpol. In the absence of the Lucan squad, who have gone out to lunch for the month (in Rio, one presumes), the snap is forwarded to the Displaced and Miscellaneous persons department. On balance they think it is probably not Adolf Hitler or the editor of the *News of the World*. They suggest I try the *Tatler*.

The program costs £24.94 (sic) from Micro Tax Ltd., Barrett House, 7 Chertsey Road, Woking, Surrey GU21 5OB.

Adolf Hitler is 94. ○



International Resource Development Inc.

Nary a decision is taken in the micro world these days without lengthy consultation of those expensive oracles, the market research organisations. But is this wise?

Where would we be without International Resource Inc., purveyors of high class all-American futurology? Barely a day goes by without some ludicrous 'news' release from this organization catching the *Newsletter* desk a glancing blow on its way into the WPB.

"Simulators May Make Military Training One Big Video Game", screams the headline of the latest masterpiece, crafted, I note, by one Suzanne Bores *(sic)*.

The bottom line on all this is that International Resource Development are selling something, just like everyone else. In their case its 579 page 'forecasts' of the future. Megabuck pricing obtains, naturally.

Since the last three market reports to come our way from different sources reached triangularly opposed conclusions – and they were talking about the past – you may wonder what hope there is for futurology in such an unstable marketplace.

Allow me to leave you then with a few pearls from Ms. Bores latest oeuvre:

I particularly liked the following logical induction: Military simulators and video games both, according to the report, "...attempt to replicate the 'real' world". *Therefore* "...inevitably, the two technologies will interconnect".

Indeed, IRD think it is already happening. "It's not a bad strategy as far as training is concerned. Many of the youngsters entering the services have played video games, and simulators designed in such a fashion may facilitate better and quicker learning."

A further subject for consideration is the "...placement in recreation areas on military bases thereby transforming (in the minds of the users, at least) that 'training' into 'entertainment'".

A ghastly thought has just occured to me. What if it's all true? ○

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NEWSLETTER

Design your own computer

Current computer designs a load of old cobblers? Well, why not do-it-yourself?

'Morning class. Settle down, please. Our task today is to create a personal computer...'

Well, take a look at what's available in the shops. Half of it designed more than four years ago (stand up Atari, Texas Instruments, Commodore, Grundy); most of the rest might just as well have been for all the attention that's been paid to what, with characteristic infelicity, the industry calls 'user friendliness'.

Surely we can do better?

Eyes down then. We start with the screen. The very minimum we'll settle for is 9" diagonally; that's about a third smaller than this page. Naturally we won't want to be mucking about with heavy, bulky, boring old cathode ray tubes. Pending the pleasure of Uncle Clive's Sinclair *Microvision* flat screen, and/or a fall in the price of electro-luminescent displays (as used in the Grid Compass), we'll settle for good old liquid crystal display.

The largest you can actually buy is Epson's 8-line, 40-character wide LCD; it's due to surface shortly on Tandy's remarkable Model 100 Personal Executive Workstation. Nice. But not quite nice enough for our purposes, which include word processing. For which we are going to want the industry standard (ho, ho) 24-lines of 80-characters.

Actually what we'd really like is upright A4 format. However, seeing as how we want to carry the beast around in our briefcase, the whole thing can't be any bigger than a telephone directory.

Fortunately, a full size typewriter keyboard can just be fitted into this size with enough room to spare for our special user friendly keys: HELP, UNDO and so on.

Since we will want to use our DIY system on the top of double decker buses, we'll opt for rechargeable batteries instead of mains power. CMOS circuitry, with its low power requirement would seem to be called for. Fortunately CMOS chips have simultaneously increased in speed and decreased in price.

Naturally we'll have a mouse, built-in autodial/auto answer modem for communication over the telephone, and a full complement of interfaces. No nonsense, however, about disks, hard, floppy, or flaccid. *All* storage will be in RAM. A megabyte of it, with mercury battery backup in case our penlight cells go flat.

Software

As a special exercise, members of the class will divide into three groups, to argue the relative merits of the following operating system/application environments: MSDOS 2.0 plus Microsoft mouse graphics manager; Digital Research *Concurrent CP/M* plus *Monarch*; MSDOS 2.0 plus *VisiON*. Combined with a mouse, all of the above will give our prototype personal computer *LISA*-like capabilities.

For preference we will get the Bristol Software Factory to describe their *Silicon Office* database-cum-calc-cum-word processor package onto ROM chips. In the highly likely event of John Kyle-Price playing hard to get (wouldn't you if you were that handsome and drove an XJ6?), we should endeavour to persuade Big Ben Rosen to licence his putative firmware versions of *1,2,3*, which though not in the same league, is probably the most user-friendly combination of a database and spreadsheet.

Did we forget to specify high resolution graphics? We're going to need them for all those icons and windows, not to mention the incredible shrinking graphics.

Sounds good? But not like any system you ever saw, right? Especially for under a grand. Well hang about a bit. Just maybe your Uncle Julian knows something you don't for once..... ○

The shape of an Epson...

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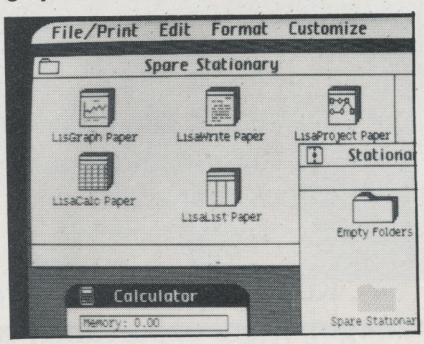
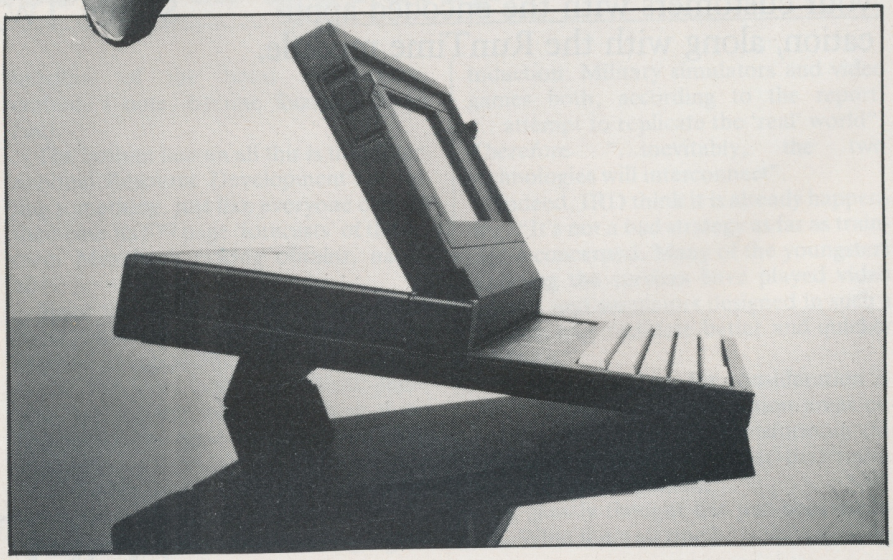


...On a flat screen like the Grid Compass.



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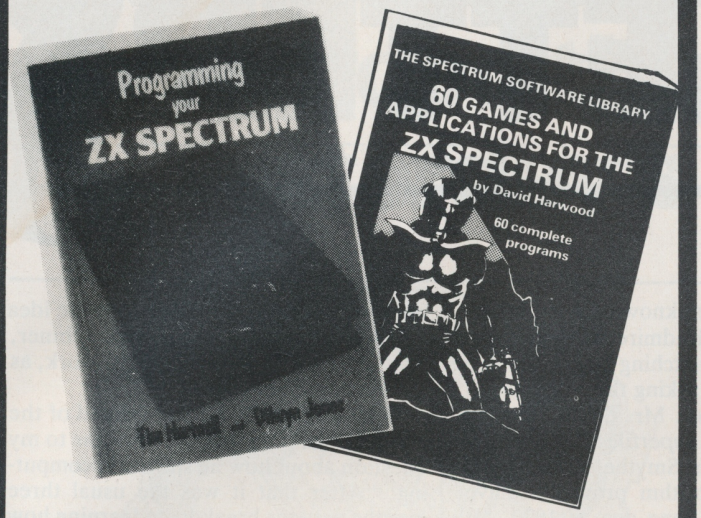
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(A) Series are all BUFFERED MODELS

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SIRIUS 1128K with 1.2mb s/s disks	£2095.00
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JULIAN ALLASON'S

NEWSLETTER

In the family way

American software men have an inborn talent for publicity. Brits, it seems, are more modest. Donning my winkle pickers, I went west to winkle one out...

Old King Cole was a merry old soul, but not half as merry as Peter Laurie.

Sometime colour supplement journalist, author of cult books on topics as diverse (or perhaps not) as Scotland Yard, drugs and Civil Defence, Laurie was latterly the editor of *Practical Computing*. His editorials, single page oases of original thought amidst reams of dross, are still missed.

Recording the ghastly fates which have befallen editors of that organ, my late, lamented colleague, *Inside Trader*, noted that one had gone mad, another's head had swollen up whilst "poor Peter Laurie has gone into software".

It was curiosity about this decision, tickled by whispers of some intriguing original research into artificial intelligence, that sent me battling through the traffic to west London. Barley Mow Passage, headquarters of Laurie's company, Southdata Ltd., is so far west, that he might as well have made it Bristol.

Characteristically the 'office' occupies a few hundred square feet of an old whorehouse, (*warehouse, surely? – Ed*) since superficially converted into one of those 'office space' centres for alternative businesses. The enterprises on either side of Southdata appear to be devoted to the sale of wholemeal candles, Socialist graphics, and macrame, respectively. Southdata's more serious minded clients – like the Ministry of Defence – are generally not invited for headquarters visits, for fear, no doubt, that they might be overcome by culture shock. Quite what they make of the saturnine young Adam Laurie when he comes a-calling at secret MOD establishments clad in bomber jacket, jeans and 10 o'clock shadow, is not vouchsafed.

For Southdata is very much a family business. Mrs. Laurie, 'Bar' to friends and customers alike, keeps a weather eye on the administration; Masters Benjamin, and the aforementioned Adam were deep into assembler the day I was there; software support is offered by chatty daughter Hattie.

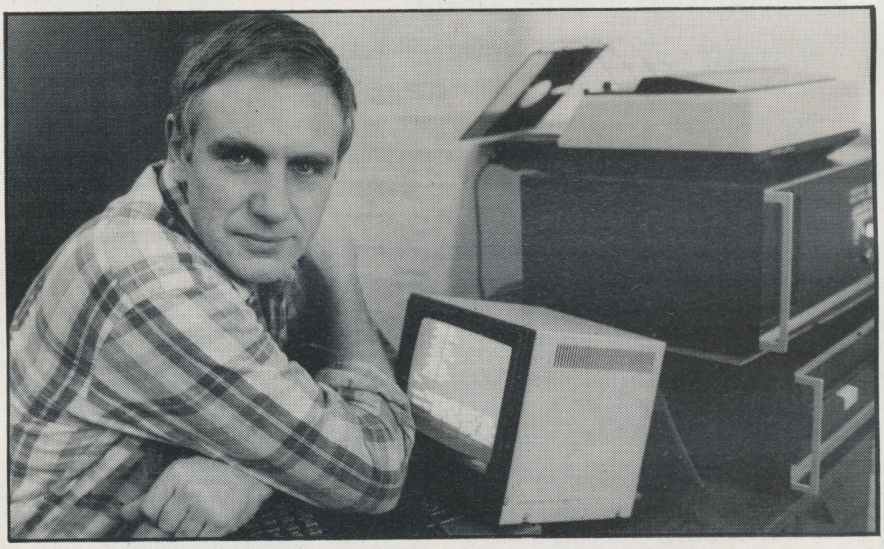
Southdata is best known for its *Superfile* database, much admired in some quarters for its fuzzy matching facility. This is best explained by asking the computer to search for a file on Mr. Smith. Having failed to find this, *Superfile* may nonetheless hoick out a Mr. Smythe. Clever stuff, although the algorithm proved to have been invented as long ago as 1870. "It works by keeping the first letter, slinging out vowels and repeated letters, and then classifying the results into categories that sound similar", explains Laurie. Like Smith and Smythe.

Connoisseurs of database management systems say that *Superfile* is one of the few micro offerings worthy of the description. A flick through the distinctly blue chip client list seems to bear this out, although it is only with the recent arrival of low-cost Winchester disk systems that the product has begun to come into its own.

It was recently described, in something called *MicroDecision*, as the worst documented information management program they had come across. Impenetrable though early releases of *Superfile*'s manual undoubtedly were, one suspects that the author's experience in this field may have been limited. Similar documents proffered by competing vendors were simply incomprehensible to non-boffins.

Four years ago IPC in their wisdom paid a quarter of a million pounds for the *Practical Computing* title. What they got was Laurie and a filing cabinet. Even then he was only on two days a week. Duncan Scot, subsequently credited with the idea for the company's real money spinner, *Your Computer*, did most of the work, as Laurie cheerfully admits.

"I asked for a computer instead of the company car," he grins in response to my question about how he started in computing. "After that it was the usual three months nervous breakdown learning how to program." He proved a fast learner.



Peter Laurie – first family of Software

"Right from the beginning I told IPC that software was the business to get into. Their considered reaction was, eventually, to fund Southdata. I bought the company off-the-shelf; they paid for it."

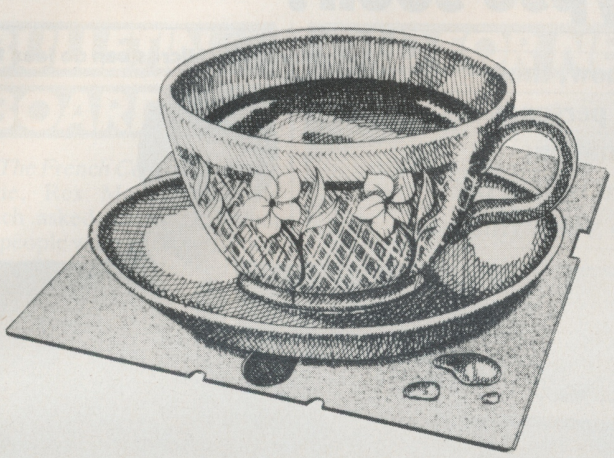
The new enterprise's first product was a spelling corrector, the first, and to the best of my knowledge, the only one to favour English – as opposed to American – spelling. Laurie had 'found' some paper tape which just happened to have the contents of the Oxford dictionary embossed upon it. "No one bought out spelling correctors, of course, because no one is very interested in spelling correction".

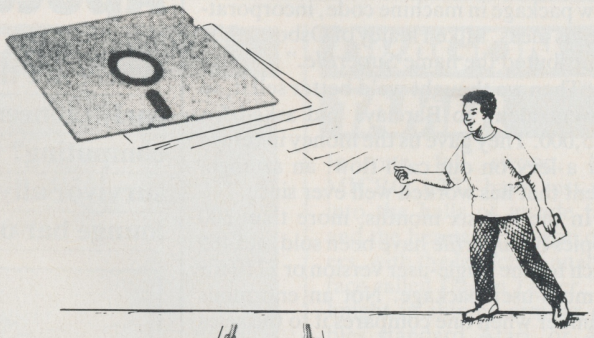
At about this point one Dr. Peter Reynolds wrote a letter to the *Artificial Intelligence Bulletin* asking why no one would take him seriously. Being inquisitive, as well as merry, Laurie went up to Brunel University to find out.

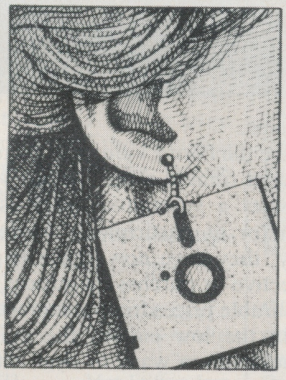
Reynolds proved to have invented a new kind of database management system, the central idea of which was that any sort of data should be accommodated without the need to specify it in advance. So an explorer might record the countries he had been to; a criminal his convictions.

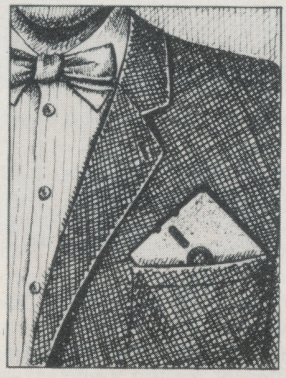
▷

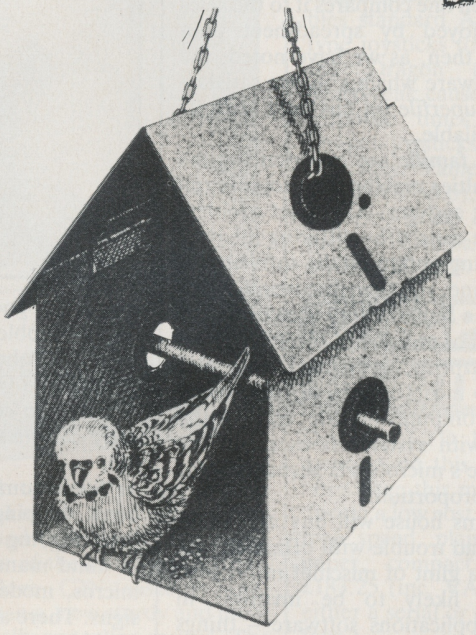
Now that Superfile is here: some good things to do with yesterday's databases.











Don't throw those old disks away! An obsolete database could make some budgie very happy. Superfile, the advanced new British database manager, could make you even happier. Just look at the advantages:

☐ Variable length items – store the data you type in without padding – double your disk capacity.

☐ Search on all items in the database.

☐ Flexible records – add new Fields at any time.

☐ Superfile tacks itself onto CP/M and makes the database accessible to programs in any high level language.

☐ Logically a multi-file database: relational searches easily done via high level language.

☐ Simple-to-use Screen Forms and Report generator packages.

☐ Multi-user – on MP/M, CP/Net, Turbodos Shelton SIG-NET.

☐ Made in England and widely used by the Government, Hospitals, schools and Universities.

☐ Prices: single user £485, multi user £710.

SUPERFILE

THE FREE-FORM DATABASE

Southdata Ltd., 10 Barley Mow Passage, London W4 4PH
01-994 6477

JULIAN ALLASON'S

NEWSLETTER

▷ "We were impressed," recalls Laurie. "So we went away and wrote a completely new package in machine code, incorporating his ideas. Mike Healey of Osborne UK contributed the name *Superfile*."

"Then we thought we'd better sell it, so I went along to Barclays and asked for £75,000. They gave us the money in return for a levy on our cash flow, an arrangement that has worked well ever since."

In the last six months, more than 300 copies of *Superfile* have been sold, at £485 each for the single-user version or £710 for a multi-user package. Not an enormous number when one compares it to the sales volume enjoyed by spreadsheet publishers, but then, as we have noted, the sort of hardware which you can satisfactorily run *Superfile* on has only recently become available.

Laurie *et famille* are experiencing the usual difficulties making the program run on different systems. The chief problem seems to be caused by differing memory sizes. "Having optimised the software for a 64K machine, you then discover that, for example, the *SuperBrain's* idea of 64K is actually 56K of user RAM. This can come as a nasty surprise," grimaces Laurie. Not surprisingly most customers have come from the computer-literate end of the spectrum, with systems houses and the Civil Service's micro units accounting for the largest proportion.

"A systems house will buy it because they have had trouble with dBase II," he notes with a glint of mischief in his eye. "They are likely to be involved in specialist applications software – things like a parts retrieval system for a garage that could well take two months to write in BASIC. They can convert *Superfile* in two days."

Although there are other excitements on the horizon, most of the efforts of the family Laurie are still directed towards *Superfile* and its derivatives. "It's inevitable. You start by writing a program, and think it's finished. But then you have to keep on spending. Programs suffer byte rot," he adds mysteriously.

The AI product of which I had heard rumours proves to be a rule finder. Laurie explains this by differentiating it from ordinary expert systems – "You have to give them the rules. What we are working on *deduces* the rules from the data. In short it looks for patterns."

Aha. That at least ought to make our readers in the intelligence community sit up and take notice.

Meanwhile, watch out for *Superfile*. It may be closer than you think. The Inland Revenue just bought a whole load of copies... ○

Apocalypse soon!

Where are they now, those early pioneers of personal computing? I found one survivor alive and well in the lounge bar of the Swan Hotel...

John Marshall: "Micros can do less than you think."

'What goes up must come down. The bubble must burst'.

John Marshall, late of Nascom, now boss of Gemini, is doing the talking. A man who knows all about the industry, and a certain amount about burst bubbles too.

"Some home computer companies have been shipping a load of rubbish, and they're going to pay for it." Marshall has in mind manufacturers of me-too home micros, modelled on other people's designs. There are more of them about than you'd imagine.

John Marshall is a big man, at least 6'2" and quiet with it. He was in right at the very beginning of personal computing, with his *Nascom 1* single board computer. Short of capital, and perhaps business experience, the company foundered, and was eventually taken over by Lucas Logic, in whose care it continues.

Since then Marshall has adopted a low key approach, selling his *Gemini* computers mostly to OEM, the ludicrously ill-named 'Original Equipment Manufacturers'. In two and a half years he has sold 5,000 of them, to customers like British Telecom, who use their boards for a system called *Miracle*; if you complain about your telephone bill, the attention it receives will be nothing short of miraculous.

But perhaps more interestingly Marshall has been quietly shaping a co-operative movement amongst independent dealers. "*Micro Value* was formed when the receiver called in at Nascom refused to support dealers with advertising. So we banded together to do it ourselves," he explains.

Like the *Photo Value* syndicate of independent camera shops, *Micro Value* still provides a substantial advertising platform for its participants. More significantly, they have now begun to use their collective as purchasing muscle to obtain favourable prices from manufacturers.

"In the low end of the market, the manufacturers want to deal with as few people as possible, so we are already seeing a benefit," observes Marshall.

Until recently, *Micro Value* membership consisted almost entirely of Nascom dealers; now new people are coming in. It is still fairly informal, although the centralised buying of Dragons, Texas Instruments and Sinclair machines has begun to show results. "Our biggest problem is in undoing the damage that you, the media, cause," Marshall observes drily.

Me?

"The media, the manufacturers, the advertising people – they all conspire to make the purchaser believe that he can do anything. My neighbour thinks he can do financial planning on a Sinclair *ZX81*. At exhibitions the first thing people ask is, 'Is this a 16-bit machine?' assuming that it's twice as good as an 8-bit machine."

Marshall pauses. "It is all nonsense of course."

The joker in the pack he thinks is software. "That will be the deciding factor in whether customers are satisfied or disgruntled."

And there, I think, speaks a man who knows. ○

EDITED BY GILLIAN ASPERY

& PARAGRAPHS

New applications... New add-ons... New hardware... New software...

Our quick summary of all that's new.

BULLETIN BOARDS

In *The French Connection*, this issue, Rex Malik poses the much asked question: "What do people want to do with computers?" – *Computerised Bulletin Boards* may be one answer.

There are now six such Boards in the UK, carrying local information, messages, personal advertisements (etc). They are open to anyone with a micro and a modem, wishing to browse or add information for the price of a phone call.

Most boards are run by dedicated hobbyists so give a thought to the timing of your call, but if you'd like to know more ring any of the following numbers out of the system hours listed:

Hull 0482 859169	Tues/Thurs 7-10pm
London 01 399 2136	Sun 5-10pm
Tyne & Wear	
0207 43555	Daily 2.30-9pm
0207 32447	Daily 7pm-midnight
Liverpool	
051 220 9733	Mon-Fri 9am-5pm 7.30-10pm Weekends 12.30-10pm (Ring once then dial again)
Shropshire	
094875 378	Daily 11am-3pm 7-11pm
Milton Keynes	
0908 613004	Daily 9pm-midnight

If you don't live in the local vicinity of any of these numbers not to worry, there are no boundary limitations.

OLD FOR NEW

COMMODORE have announced two interesting snippets of news this month. The first is that from June 1st, first time home computer buyers will be offered a first in good value; a *VIC 20* computer, a *cassette* deck, *Introduction to BASIC Part I and four cassette games: Blitz, Hoppit, Race* and *Type-A-Tune*, for a mere £139.99 (inc. VAT). The limited edition boxed sets will be on sale in retail outlets nationwide, so its first come first served.

The second which you'll be glad to hear is not strictly speaking a first, but a mere second (re-hashed first) is the news of the re-designed Commodore C2N cassette unit, now in a 'new sturdy and more visually appealing casing'. The price remains unchanged nonetheless, £45.95 (inc. VAT), and the unit is compatible with all Commodore computers.

For further information and details of your nearest Commodore stockist phone 0753 757411.

DRAGON TAMER

In one fell swoop, MR. MICRO LTD have just shot into the halls of arcade fame and the hearts of Dragon owners, with the launch of an interface called *Dagon Tamer*. This knight in shining armour enables standard Atari, or Atari type joysticks to be used with the Dragon to end the heartbreak caused by the slow response times of standard Dragon joysticks.

Dragon Tamer costs £9.95 (inc VAT/p&p), and includes two free game cassettes. For further details call Jim Gregory on 061 728 2282.

CHEAP PRINTER

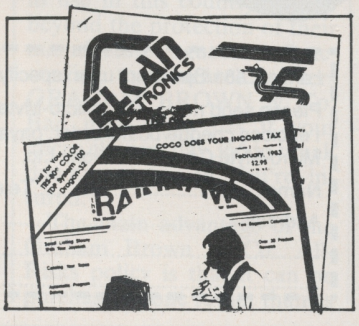
DATAC LTD have earnt a mention on this much fought after page this month for producing a low cost, red or black, high speed, plain (i.e cheap) paper, compact printer for £183.25 (inc. VAT, p&p, and either a serial or parallel interface.)

The bad news is that it can only print 40 characters per line, and is not capable of graphics, nevertheless price-wise Datac are cetainly on the right lines.

For further details of the 510 ring Andre Kay on 061 941 2361, dealer enquiries welcome.

DRAGON SUPERMARKET

The day will come when leaving the four walls of your home to shop will be an anathema. Meanwhile ELKAN ELECTRONICS are doing their bit to persuade us to sit back and take life easy. For Tandy TRS-80 Colour and Dragon 32 users they are now producing a 'one-stop shopping' catalogue called *The Dragon Supermarket* which aims to cater for all



(well, almost all) your needs (sadly long-legged blue-eyed blondes are still hard to come by).

In addition the D.S is distributed free every month with two magazines from the USA: *Rainbow* and *Colour Computer News* which can be purchased on subscription.

For further information phone 061 798 7613 (24 hours).

STOP PRESS!

News has just come in that ATARI have also joined the price-cutting bandwagon. The *Atari 400* is now down to £149.95 and the new price also includes the BASIC ROM Cartridge. The *800* is also down at £299.00.

ATTENTION! - all ZX 81 (16K) and Spectrum (48K) users - get this, the ...

Micro-Myte 60

It's the high speed computer phone link you have been waiting for:

Transmits/receives at 600 Baud: Twice the speed of most other acoustic modems (including professionals).

Economic to use: Communicates data direct between compatible users. Typically 50K bits per two minutes of telephone time. (Cheaper than a first class letter.)

Simple to operate: Connects directly to your cassete input/output sockets.

Use your home computer like an on line terminal. Link up with your friends by telephone or cable.

The Micro-Myte 60, in its sturdy moulded plastic housing, complements your home computer equipment.

Stop press!

Micro-Myte 60 will operate with all makes of home computer - software available soon.

Only

£39.60

complete, inclusive of VAT, post and packaging in the UK only.

No fuss, no hidden extras no rental costs

Each kit comprises an acoustic modem, ZX81 and Spectrum software on cassette, connection cable and operating instructions, together with a twelve month guarantee.

Micro-Myte Communications Ltd
Polo House
27 Prince St.
Bristol 1

Telephone (0272) 299373

Callers welcome

I am a ZX81/Spectrum user (specify .....)

Please send me ..... Micro-Myte 60 modem(s) at £39.60 each.
I enclose cheque/postal order, payable to Micro-Myte Communications Ltd.

Name .....Telephone .....

Address .....

.....

.....

& PARAGRAPHS

EDITED BY GILLIAN ASPERY

COMPUTER EYE

The next time you get the urge to measure a bubble, DIGITHURST have the solution. *MicroEye* permits a range of microcomputers (including the *Model B BBC Microcomputer, Research Machine 380Z, Apple, Commodore, Hewlett Packard, IBM* and *Sirius*) to be linked with a home video recorder or camera, to transfer pre-recorded images into the micro. The picture is then digitised and crunched into a Binary Image which permits detailed analysis. Alternatively it can be stored on a disk for future processing or reproduced on a printer. The real value of *MicroEye* emerges when a closer look at radio active material is needed, or when it's important to measure exactly how much the culture of bacteria on your Petri dish has grown overnight.

The total package, including cable connections and a suite of software, costs £295 + VAT and is available from:
Digithurst Ltd,
Leaden Hill, Orwell,
Royston,
Herts SG8 5QH.
Tel: 0223 208926.

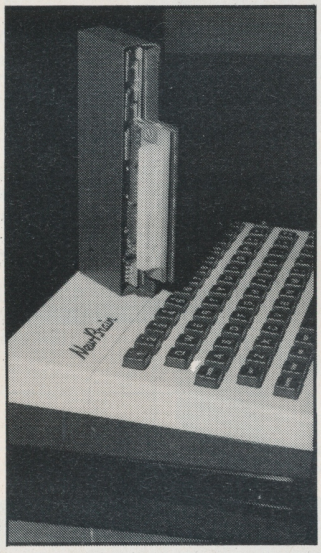
GUARD DUTY

Faulty micro? Or faulty electricity supply? Either can lead to computer failure, but do you rush off and abuse your dealer or the local electricity board when the vital disk is wiped in the midst of that important demonstration/lecture/exhibition...

A new device from MEKRONIC CONSULTANTS called *The Sentry* may provide the vital clue; when plugged into the same standard 240v A.C socket as the micro, one, two or three lights are triggered if the Sentry experiences slight, moderate or severe interference. So, if your micro simultaneously fails, the culprit is located and you can begin to cast abuse in the right direction or alternatively buy a constant voltage transformer and play it safe.

The Sentry costs £55.20 (inc. VAT/p&p). For further details phone 061 798 0803.

CUSTOM NEWBRAIN



With the help of GRUNDY BUSINESS SYSTEMS LTD and £55 plus VAT, NewBrain, the portable micro, can now be customised using a *32K EPROM module.*

The module provides four 8K sockets and plugs into the micro's standard expansion port. Grundy also offer an EPROM 'blowing' service for OEM customers at £8.50 plus VAT per EPROM for any quantity. So, if for instance, your 20 soap powder salesmen need a special (custom) program for the NewBrain's carried on their selling trips, Grundy can make them to your specifications.

For further details ring 01 943 1901.

MICRO INSURANCE

"By the middle of this year 50% of all personal computers in use in this country will be beyond the protection of their manufacturer's guarantee", according to insurance brokers GRAHAM BROWN & Co. Bad news n'est pas if your micro chooses day 366 to break down: not so, **IF** you're insured.

The main advantage of the Graham Brown & Co. All-Risks policy is that it can be purchased alone rather than as a home insurance add-on. It is intended to cover personal/educational use and occasional business mileage if its primary function is in the home. Premiums begin at £7.50 for £100 of cover for dedicated peripherals and the computer, and rise in stages of £100, to £15 for £500 cover. The policy is underwritten by the British National Insurance Co.

For further details ring Chris Bower on 0483 65651.

VIC RAM

As game and educational software for the VIC 20 becomes increasingly sophisticated, or if you have ambitions to acquire some business software, the limitations of the VIC's standard 3½K RAM start to show. The result – a vast array of *add-on RAM packs* have appeared on the market; but none, that we can find as cheap as those produced by STARTECH and FOX ELECTRONICS.

Startech have a 16K RAM pack at £28.95 (inc. VAT/p&p). Fox Electronics produce a switchable RAM cartridge called *The Vixen* which provides the option of 16K or 8K and 3K RAM at £39.95 (inc VAT/p&p).

For further details phone STARTECH on 051 727 7267 and FOX on 0256 20671.

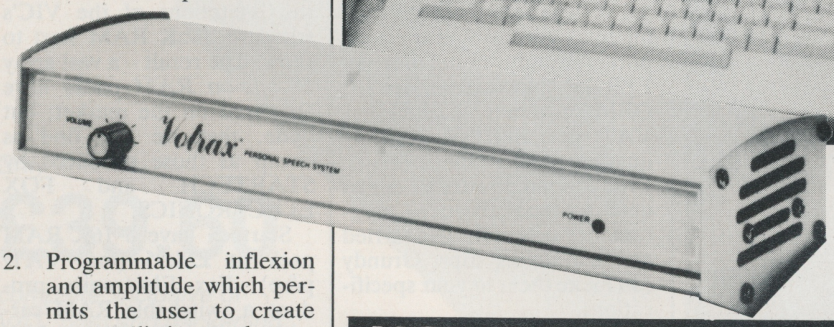
EDITED BY GILLIAN ASPERY

& PARAGRAPHS

TRON TALK

Way back in September 1981 we reviewed a speech synthesizer called the *Votrax Type 'N' Talk* in a most favourable light; but lamented the fact that there was no UK distributor. Now at last... a mere 18 months later CYBER ROBOTICS LTD have crept out of the woodwork and shyly admitted to selling the product that has been jamming our phone lines with queries for months. So there's the good news, and here's the even better news: they're now also distributing, (and even admitting to distributing) the new *Votrax Personal Speech System* which incorporates the features of the Type 'N' Talk plus a number of other advanced facilities, such as:

1. The ability to send *any* text (computer or keyboard generated) to the PSS which automatically translates it into 'speech'.



2. Programmable inflexion and amplitude which permits the user to create more realistic speech.
2. The addition of music with programmable ADSR (attack-sustain-decay-release, the way in which a note created by a musical instrument behaves).
4. A built in clock with programmable spoken alarms, and not to be forgotten... the Vochord, a musical sounding voice facility whose great claim to fame is the "Yes... No..." voice of BIT in the film TRON.

The *Type 'N' Talk* costs £318.75 (inc. VAT/p&p) and the *Personal Speech System* £434.75 (inc. VAT/p&p). For further details phone 0223 210675.

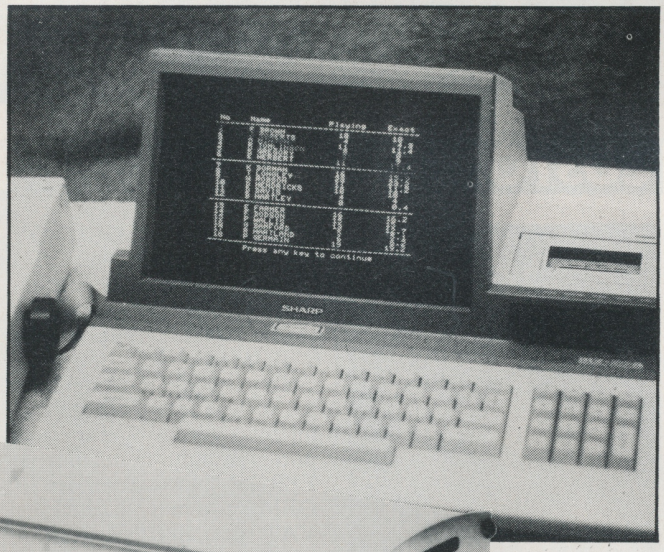
HOLE-IN-ONE

Golf club secretaries beseiged by computer salesmen following the CONGU decision that handicaps should be revised after every game, not annually, lend an ear to one *final* word on the matter.

SOLO SOFTWARE have designed three packages at a reasonable price to combat the problem: *Clubman* to do handicap calculations and provide competition results in winning order; *Club-Sub*, to handle annual subscription renewals, overdue accounts and mail listing; and *Club-Start* to calculate information on the source of the club's income.

All three cost £170.60 (inc. VAT) and run on a Sharp MZ-80A 48K computer and Epson MX80 printer. The hardware if desired can also be supplied by SOLO and costs £1059.15 (inc. VAT).

For further details call Nick Bewley on 0905 26524.



SINCLAIR SPECIAL

The third, and final 'starter pack' to have caught my attention this month is the McNULTY INTERCHANGE *Spectrum Starter Pack*: a Sinclair 48K Spectrum and accessories, an RS232/V24 communications adaptor, the Spectrumodem and professional club membership, "All for less than £200" - i.e. £199.99 (inc. VAT). McNulty's package, including a modem and an adaptor, puts the emphasis on the communications potential of micros, a potential which John McNulty rates highly if we believe his boast "We will do for communications what Sinclair did for computers". True or False, if you're interested in experimenting with Computerised Bulletin Boards this is a good offer.

Alternatively if you're already a proud Spectrum owner, the modem is available separately at £49.99 (inc. VAT). For further details ring (0923) 52020.

Postscript

News of another modem has just come in. The *Micro-Myte 60* at £39.60 (incl.VAT/p&p) is available for both the Spectrum and the ZX81 from MICRO-MYTE COMMUNICATIONS LTD. Call Steve May on 0272 299373 for details.

HOME BASE

Until June 10th LASKEY'S 'Micropoint' stores are offering a portable colour *Sanyo* or *Hitachi TV* and £100 worth of software free with the purchase of every *Apple Home Base System*.

The system costing £1398 includes the Apple IIe (with 64K memory and hi-res graphics) plus single disk drive and control adaptor.

For details of your nearest store ring Jane Shepherd on 01 486 7897.

NOW

c Nulty's Interchange

(0923) 52020 FREEPOST WATFORD WD1 8FP

YOU CAN BROADEN YOUR COMMUNICATIONS SPECTRUM

Spectrumodem

Now Included In Starter Pack Price

SEND NO MONEY - We will invoice when your order is ready

Item	Qty	Unit Price
Professional Spectrum Starter Pack:— 48K Spectrum RS232/V24 Communications Adaptor Professional Spectrum (Prospect Club) *PLUS* **Spectrumodem** Full duplex 300 b.p.s. switchable call or answer plugs your Spectrum straight into the phone line.		NOW ALL FOR ONLY **£199.99**
McMultimodem All combinations of 300 and 1200 b.p.s. switchable call or answer, direct connect.		**£99.99**
the FIX IT kit RS232/V24 interface fixer. (Swaps sex/patches pins/shows status).		**£99.99**
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MCP 07/83

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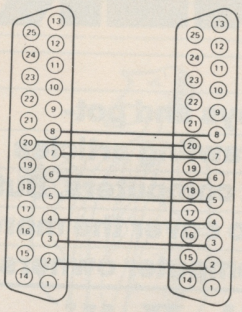
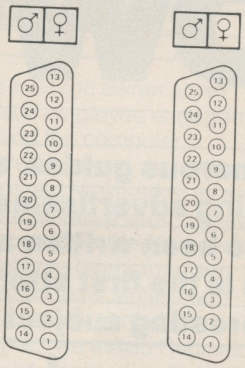


Cable Length	1 mt.
Screened	
Unscreened	✓
Number of Connections (Check!)	8

We assume standard connections unless you draw in cross overs or patches.



Cable Length	
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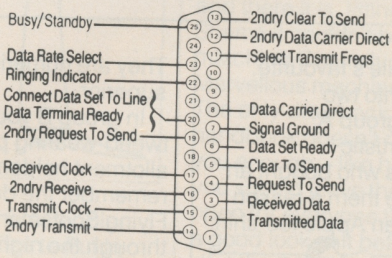
Unscreened	
Number of Connections (Check!)	

Normal Connections



What do you want to connect?

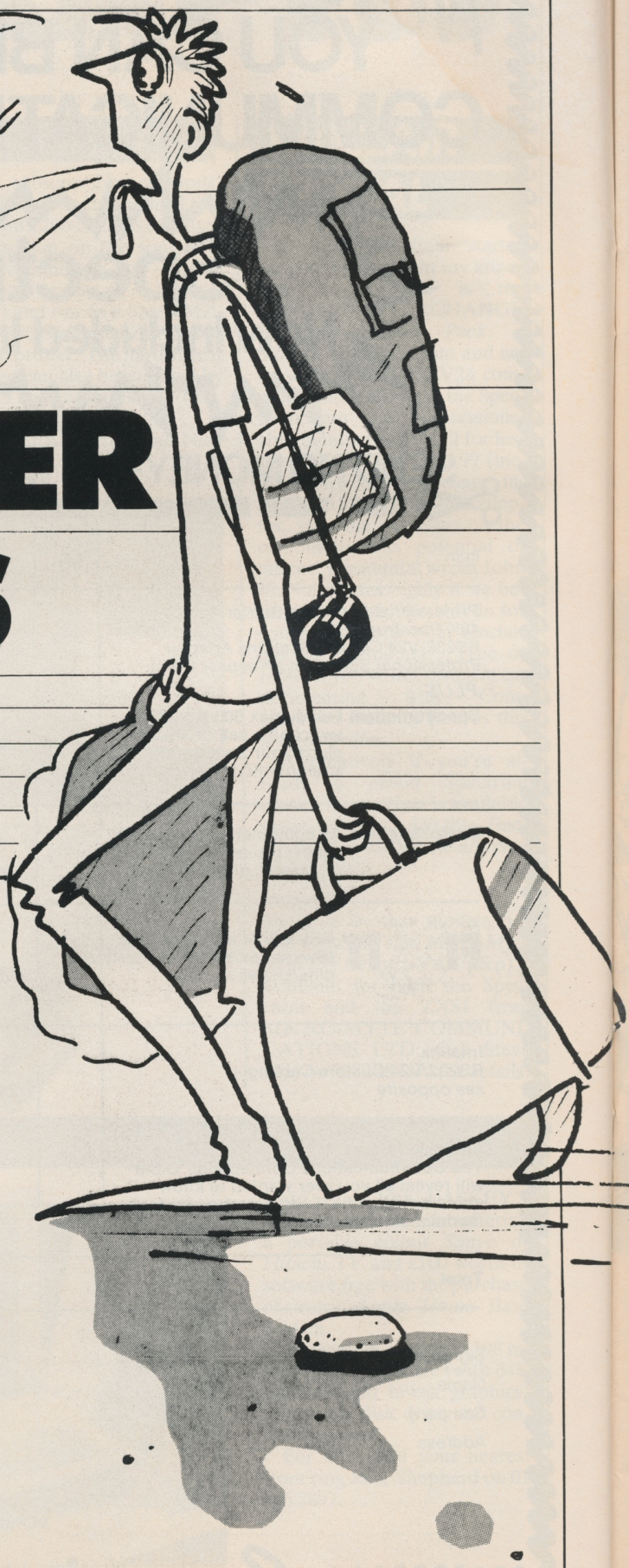
Communications Connections

UPTON BIDDLESCOMBE'S

GUIDE TO COMPUTER OWNERS

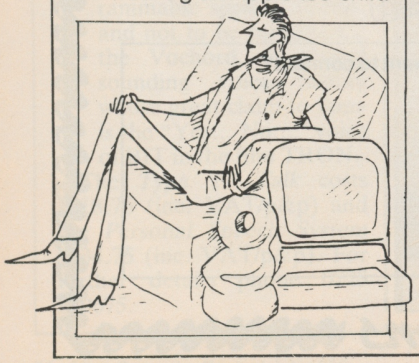
Numerous guides, surveys and pot-boiling advertisement-trawling articles have been written about computers. But this is the first attempt to cover the more interesting subject of computer owners.

Cartoons by Julie Hollings



APPLE II

The fructophile's favourite. Owners fall into two categories: group A comprises artistic sophisticates who bought an Apple to give them a reason for wearing an Apple tee-shirt.



They are numerically superior.

In group B you will find tweed-wearing pipe-bearing allotment holders who remember the days when the Flying Scotsman pounded through the night carrying the nation's mail from one capital to another, its eerie midnight whistle echoing through the elmwoods as the nightowl pauses in its hunting and the Lincolnshire poacher looks up from his game with a faraway smile plucking at the corners of his lips. This is not to say the Apple II is obsolete, just that it appeals to reminiscence.

BBC/A

The computer for addicts of 'Call My Bluff'. BBC owners are a tight-knit group, a situation exemplified in their espousal of Fair Isle slipovers: earnest, patient, blessed with an ability to take the balanced view, devoted to Angela Rippon despite recent events. BBC owners drink real ale, vote SDP, drive Metros, read the *Guardian*, like the occasional meal of mixed pulses. They are prepared to wear the price and delivery delays demanded for the BBC micro on the grounds that 'you have to pay for quality' and they don't like subsidising foreign jobs.

After a pint and a half of Adams they will argue vehemently that:

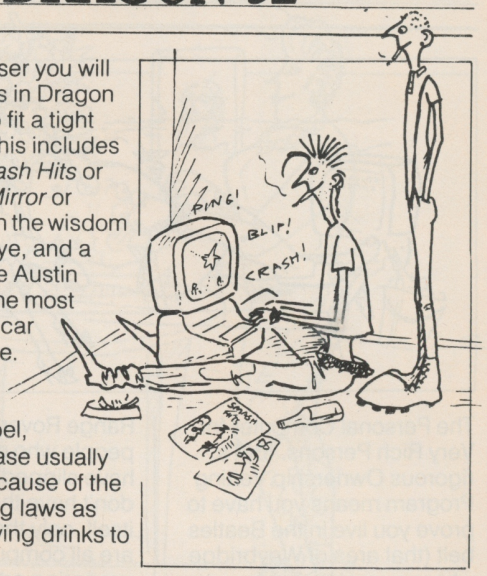
a there's nothing wrong with a subsidised public broadcasting corporation selling consumer goods,

b the Japanese-made chips inside it are clever copies assembled by a co-operative of ex-National Coal Board employees in Kirby,

c the ability to attach numerous non-standard CPUs is wonderful and well worth paying for, even if no-one has actually been able to accomplish that just yet (or even find a reason for doing it), and

d the keyboard is every bit as good as that on an Acorn.

DRAGON 32

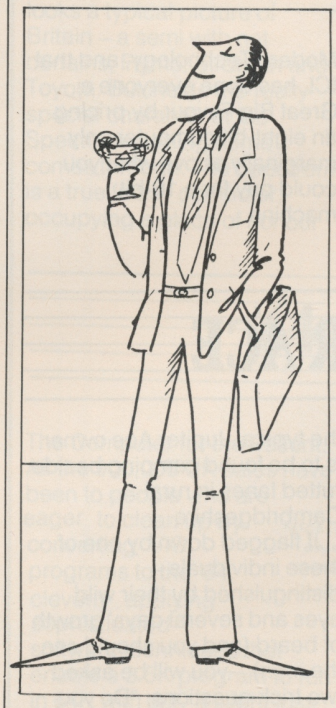


To be a Dragon user you will either have shares in Dragon Data or be able to fit a tight personal profile: this includes readership of *Smash Hits* or *Sounds* and the *Mirror* or *Express*, a belief in the wisdom of Captain Birdseye, and a commitment to the Austin Ambassador as the most impressive motor car currently available. Dragon users drink Coke or Carling Black Label, but in the latter case usually do so illegally because of the country's licensing laws as they relate to serving drinks to minors.

VIC-20

The Ideal Computer for the Short-Sighted. Latest sales returns indicate that careful product design has certainly born fruit: the average VIC owner is indeed myopic. That justifies Commodore's imaginative approach to computer design, featuring a wide border around the display so as to permit the user more easily to identify the edge of the screen as distinct from the sides of the TV set and indeed the sunflower-print curtains behind it. Minimising the number of characters that can appear in the display is another aspect of the VIC that is welcomed by the typical purchaser, preventing as it does any chance of sensory overload. The omission from the VIC manual of irrelevant information (e.g. all that stuff about how to use the VIC) has also encouraged the visually deficient to espouse the machine eagerly.

EPSON HX-20



The Computer For People With Nothing Else to Put in Their Briefcase. Owners we polled report that the most attractive aspect of the impressive Epson portable is the way it can be used anywhere. This is because it needs no power supply. Nor does it require battery back-up. In fact, it doesn't need any electricity at all. How can this be?

From our files we assess the average owner as an Epson employee engaged in selling the computer. Excluding them, we settled on Reginald Newmarket as a representative user to answer the question. Meeting over a lunchtime Marguerita and quail on toast stuffed with squid at Langan's Bistro in Mayfair, we asked Reginald why he decided on the Epson. Fingering his immaculate Yves St Laurent tie he said, "It's the first user-friendly computer. Needs no electricty, don't you know. All you have to do is open your briefcase and take out the two typewritten sheets on top – and there it is, fitting neatly. Shame it couldn't be in matching Connolly hide. Marvellous machine, though. The only drawback is that the handbook doesn't really tell you enough – like how long you should leave the briefcase open for everyone there to get a good look at it before you shut the lid. The problem is one of balance: too quick and not enough people see it, too long and they think you're trying to impress them. Personal advice? Allow five seconds plus two seconds per person, and if in doubt lift it out altogether to feel around for your calculator."

Reginald works in import-export.

ATARI

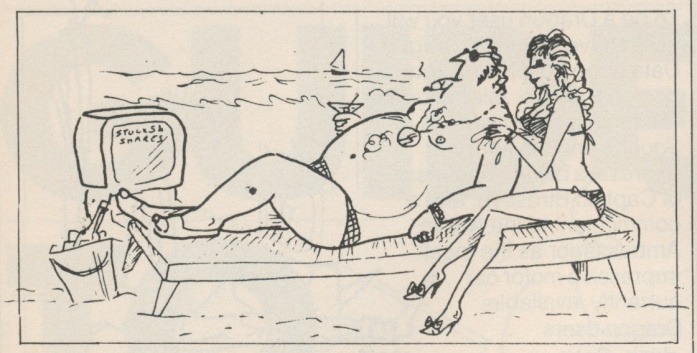
The Gamesmanship Computer. Though thoughtfully provided with everything you need to program a computer (e.g. a programming language), Atari makes more money from joysticks. Atari owners are generally small (though perfectly formed) and round, with a large mouth and a tendency to scuttle aimlessly around corridors eating anything they can find.

Especially baked beans.

Between them, Atari owners have the world's largest collection of Enid Blyton books.

GUIDE TO COMPUTER OWNERS

IBM P.C.



The Personal Computer for Very Rich Persons. IBM's rigorous Ownership Vetting Program means you have to prove you live in the Beatles belt (that area of Weybridge where every house was formerly owned by one of the Beatles) and have at least two cars (one of which must be a Range Rover). The only people who might appear to have slipped through the net don't have the computer itself, only the brochures: they are all computer journalists preparing articles on whether the 8088 really *is* a 16-bit processor.

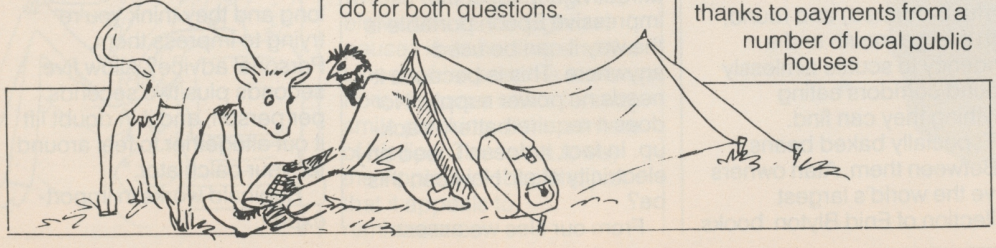
ICL P.C.

The Completeness Computer. Included here for the sake of comprehensiveness, though all purchasers are long-time ICL users who believe that ICL is Britain's only computer company, that the ME29 is a Very Wonderful Example of Modern Technology, and that ICL has done everyone a Great Big Favour by pricing an eight-bit computer only marginally above what you could pay for a 16-bit machine.

JUPITER ACE

The Traveller's Computer, so denoted by Compton Pauncefoot's forthcoming *Undiscovered Highways and Byways of Britain* in the section on 'Great Little Computers of our Time' (pub. Ramshaw & Buttock 1973). Pauncefoot gives a number of the more scenic off-motorway routes that will take you to the place where you can get a Jupiter Ace. Sadly the book's main deficiency is the lack of information about getting *back* from there, which is why the typical Jupiter Ace owner is to be found camping beside rutted lanes in rural Cambridgeshire.

If flagged down by one of these individuals – distinguished by their wild eyes and several days' growth of beard (and you should see the *men*) – you will be asked two trick questions: "Do you think Forth is better than BASIC?" and "How do I get out of here?". The answers are of course obvious: "I wouldn't start from here", will do for both questions.



NEWBRAIN

The Computer for the Phlegmatic. NewBrain owners have a stoical attitude to life, easily accepting the inevitability of the fickle finger of fate and/or a destiny that shapes our ends, rough-hew them how we will. At first this was exemplified by their shy smile and self-effacing confidence while the NewBrain was being announced, a process not dissimilar to the gestation period of an impregnated rock cake: the NewBrain was announced more times than the Burton-Taylor marriage/divorce or the imminence of the Commodore Ultimax/Max/VIC-10.

Here is a direct quote from an owner: "So be it. If it rains tomorrow, it rains. We'll all die one day. If CP/M comes, it comes".

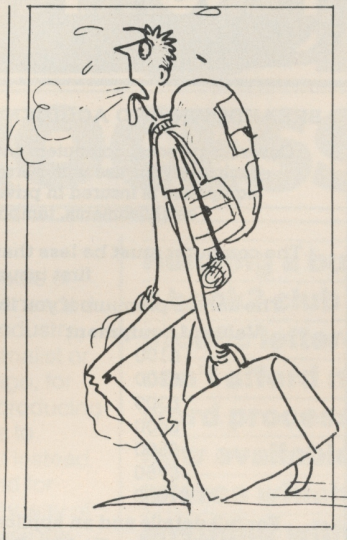
ORIC 1

The highly Personal Computer: named 'Oric 1' because only one person has one. His name is Ned Staples and he lives in Camberley.

He is quite wealthy now, thanks to payments from a number of local public houses who employ his services to clear their competitors' lounge bars; this he does by striding in, ordering a pint of Hemeling, and striking up loud conversations with perfect strangers about the value for money implicit in the Oric. He has yet to remove the shrink wrapping, at which time he would discover that the postman had to bend the parcel to get it through the letterbox.

GUIDE TO COMPUTER OWNERS

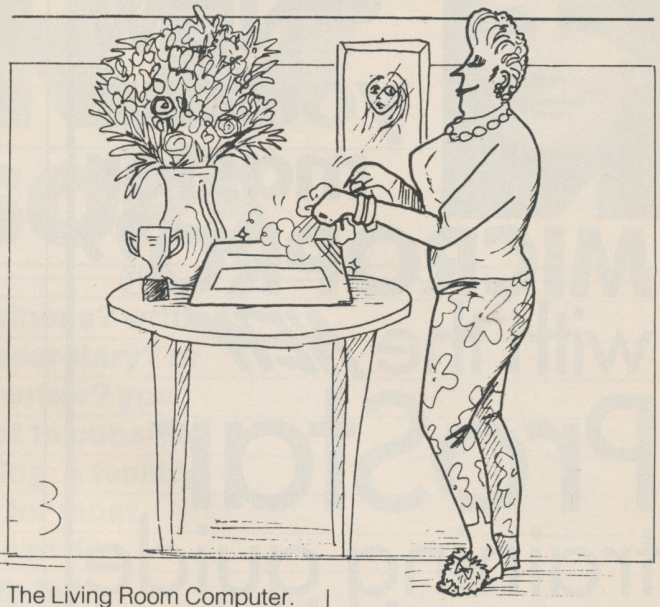
OSBORNE 1



The Commitment Computer. Owners are easily identified in Tesco's by the way they peer closely at the labels on the cans, their eyes flicking energetically from side to side (a reflex action deriving from the cleverly miniaturised Osborne screen) and their ability to reach the top shelves – they generally have one arm longer than the other thanks to the limb-stretching program that comes free with every Osborne. This operates automatically when you try to carry the thing around.

Some owners also have a slight limp. These are habitual intercontinental travellers who believed the stories about the Osborne being designed to slip under an airline passenger seat. The irremedial foot damage occurs when trying to persuade the computer to fit into a space already containing a bagful of duty-frees, a briefcase filled with one's Old Spice and other essentials, and the Osborne of the passenger in front.

SPECTRUM



The Living Room Computer. Sinclair's sales programme to install a computer in every home was extended with the launch of the Spectrum to cover every *room* in every home.

From the outside the house looks a typical picture of Britain – a semi with net curtains, Flymo, birdbath and Toyota. But inside the really special character of the Spectrum-owning home comes through. The Spectrum is a true family computer, occupying a place of honour on the living room coffee-table between artfully opened copies of *Interiors* and *Radio Times*: its role is an important one, for Mrs MacCaferty next door only has a high-jump cup, a studio portrait of Susan, and a photograph of their eldest embarking for Clacton. The Spectrum on the other hand demonstrates the owning family's sophistication, perspicacity and commitment to the future while signifying the intelligence and imagination of its progeny.

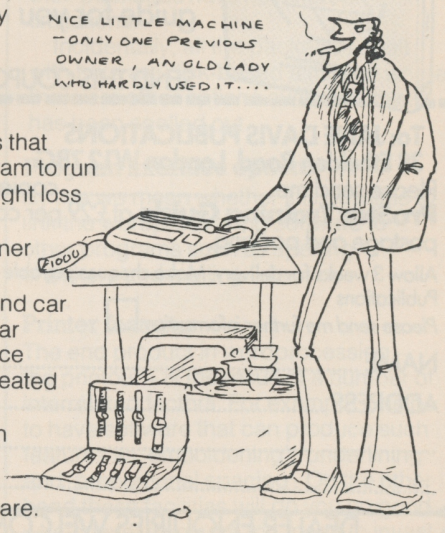
ZX 81

The Attic Computer. People with ZX81s generally live in terraced houses in the inner city areas. There are approximately a million such homes, which accounts for the one million sale of ZX81s – all these houses have small attics and therefore the household needs a computer small enough to be accomodated in a space limited by the hula-hoops, roller skates, the double *Woodstock* album, hot pants, clip-on dangly antennae for the head, tie-dye tee-shirts, frisbees, skateboards and other items that were used for only two days after being received as Christmas presents. The ZX81 fits the bill admirably, being compact enough to slip invisibly between the rusting Meccano and the back issues of *Eagle*.

'64

The Computer for the Patient. All the 900,000 UK sales have been to people who are eager to clean up by converting VIC programs to the '64, cleverly applying sophisticated software techniques that enable a 3.5K program to run in 64K with only a slight loss of performance.

The average '64 owner is well equipped to sell you a secondhand car (one careful lady vicar owner, garaged since new in a centrally heated area of the Sahara, only 20,000 miles on the clock, squire) as well as that useful '64 software.



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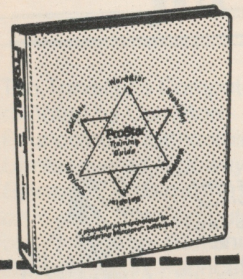

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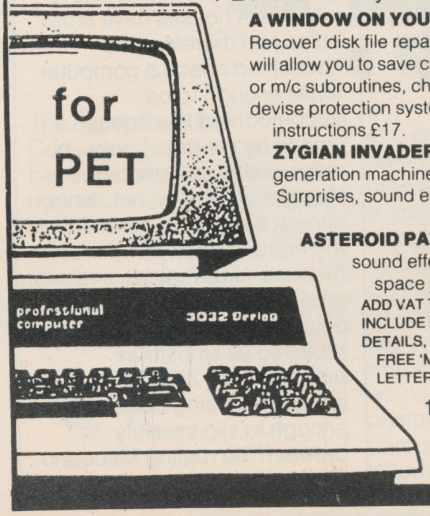

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TOP TEN

WORD PROCESSORS

Running a business? writing a book? club secretary? or prolific letter-writer? you can't afford not to consider word processing; a facility now available for most micros which can do anything within the capabilities of your most expensive electronic typewriter plus lots more. Guaranteed to save you or your business time and money.

In the fourth of his Buyer's Guides, *Charles Christian* gives a thumbnail sketch of ten of the best word processing packages and tells you what to look for when buying.

Once-upon-a-time the humble typewriter, a dictionary and a bottle of 'Snopake' were all that you ever needed to get by in the word-smithing industry, whether you were a writer a journalist or a secretary. But that was long ago, for now, as well as creating and reproducing words, you also have to be able to 'process' them. This means that instead of having to sit and rack my mind for hours in an attempt to find a witty way of starting my articles, I merely press the cliche key on my wordprocessor so that almost instantaneously a sparklingly original opening phrase is dredged up from the system's precedent library and flashed across my VDU screen ... sparklingly original opening phrases like 'once upon a time'. Yuk.

Seriously though (another brilliant phrase there) the growth of sophisticated information handling techniques in the office and business environment, thanks to the invention of the ubiquitous silicon chip – damn it, the cliche key's stuck – has meant that wordprocessing equipment now ranks very highly on many people's shopping list. One solution is to buy dedicated wordprocessors but, if you are not going to be performing clerical work on it all day long, or if you also have a data processing requirement, then you may find it more appropriate to invest in a general purpose microcomputer and arm yourself with some suitable wordprocessing software.

As to which software package you actually opt for, I suppose there are really two approaches you take. Either you buy the computer you want and then look around for a program that will run on it. Or you look for a reasonable software program and then find some hardware that will support it. Whichever course of action you take, you are going to find yourself surrounded by a whole myriad of possible packages. Indeed there are currently probably more versions of wordprocessing software available for microcomputers than there are variants of the 'Pacman' video game. It is therefore with great pleasure that we on *MicroComputer Printout* now give you our typically prejudiced guide to the Top Ten wordprocessing software packages.

But first, as ever, just a few words about some of the information categories we have included under each entry in the Chart:

Memory

The relevance of memory is that with some wordprocessing packages, although they may have been specifically written for a particular brand of micro, it may still be necessary to make certain hardware changes to the original system configuration (such as the ROM chip for *Wordpro*, the 80-column card for some Apples or a RAM memory expansion), before the wordprocessing software will run properly.

It was also our intention to give some coverage to the problem of how many pages of text could be stored in the system's memory at any one time, which is obviously going to present problems if you are dealing with some poky little system with little internal memory. Unfortunately (or fortunately – depending upon how you look at it), with the increased availability of efficient disk drive systems and cheap mass storage facilities like Winchesters and hard disks, with many packages now the only limitation on text storage is the size of the storage device. Thus, although *Wordcraft* estimate their system can only handle between 80-100 pages of text, some like *Scripsit* reckon that it would take a fast typist working flat out more than 24 hours to overload the system, whereas others confidently proclaim that their packages have no inherent limitations.

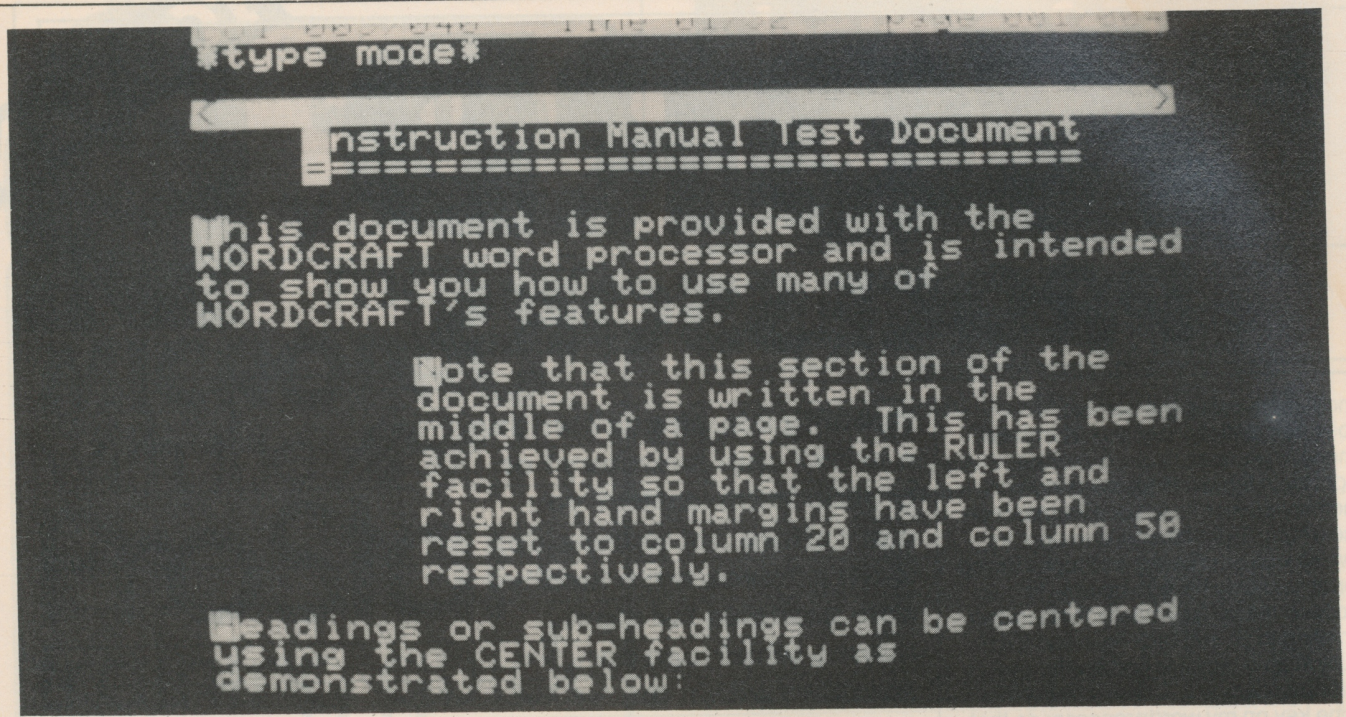
Incidentally, all the packages dealt with here are disk-based although where there are other options available, this has been spelled out.

Program interface options

By this we mean whether it is possible to link the wordprocessing software to other programs such as spelling checkers and mailing lists.

Printer features

The end product in wordprocessing – the printout – is the result of a number of interrelated factors. For example it helps to have software that can produce such features as 'emboldening', 'underlining' and 'proportional spacing'. On the other hand these facilities will do you no good whatsoever if you are too mean to invest in a decent printer or if your computer ▷


type mode
Instruction Manual Test Document
This document is provided with the WORDCRAFT word processor and is intended to show you how to use many of WORDCRAFT's features.
Note that this section of the document is written in the middle of a page. This has been achieved by using the RULER facility so that the left and right hand margins have been reset to column 20 and column 50 respectively.
Headings or sub-headings can be centered using the CENTER facility as demonstrated below:

On screen the instruction manual test document for *Wordcraft*; a word processing package available for most Commodore computers.

does not have the right software/printer interfaces. Because this aspect of word processing is therefore to some extent dependant upon the idiosyncrasies of the individual user and his or her system, we have therefore opted to lump all these various factors together.

Simultaneous printing & editing

This is a bit complicated, so don't start fidgetting if you get bored, but basically it refers to the system's ability to allow the operator to use the VDU keyboard to enter text whilst the printer is simultaneously printing out other text which has already been processed. In a business offce it is obviously important to have this feature otherwise the operator will be forced to sit around twiddling thumbs whilst the printer plods on with its task.

On a technical note (and technical notes are not helped here by the fact that different software houses employ different terms to describe the same operations), the two most frequently encountered procedures are: 'background printing' whereby the printer's output is controlled by the computer with the aid of a buffer; and 'print spooling' whereby edited text is first loaded onto disk and then fed over to the printer under the contol of the disk storage device. According to one school of thought the first method is the quicker, whereas supporters of spooling claim that the latter method frees the micro's CPU memory from having to perform mundane traffic control tasks.

Visual Integrity

This very impressive sounding phrase basically means – the image displayed on your VDU is in the same format as it will appear on the printed page. Obviously during the course of editing there are going to be all sorts of menus, instructions and cursors flashing about, but with most programs there should also be a facility to let you view the text without all that clutter.

There can however be problems with 'word wrap' whereby the VDU displays words broken up at the end of one line and continued over to the next (*MicroDecision* magazine for instance uses this method with their final typesetting), whereas when the words are actually printed they appear in the same format that *MicroComputer Printout* uses without the carry over. This may seem a relatively minor problem but it can lead to difficulties when you are trying to sort out the layout for a very long piece of text, such as a report or a conveyance.

Comments

This is another rag bag section designed to include anything pertinent that would not fit elsewhere, including the odd bit of gossip.

It also incorporates, where appropriate, any additional information about the keyboard used by the system. As a rule of thumb, the one great disadvantage of using a general purpose micro as the heart of a wordprocessing system is that you do not have a dedicated keyboard. Instead, you frequently have to resort to elaborate manual contortions pressing several keys at once to implement certain editing functions which, to put it mildly, can be a bit of a drag. To circumvent this problem some systems provide sticky labels to rename the keyboard, whilst with others it is actually possible to obtain an alternative keyboard.

Finally...you will have no doubt noticed from this survey that we have not gone into all the finer details of each wordprocessing package – such as whether it permits wide screen editing, deletion erasure, insertion, document merger and so on. Apart from the fact that it would have taken up an inordinate amount of space – which we haven't got, in our opinion any system which does not include at least some or all of these features does not merit the term 'wordprocessing software' in the first place and is therefore automatically ineligible for a position in the Chart. So hopefully you need have no worries on that account.

And now, without further ado... the Chart.

▷34

IF YOU'D LIKE TO KNOW MORE...

In the *Micro Computer Printout* **Encyclopaedia of Personal Computing Part 2**, September 1982, *John Derrick* explored in depth 'everything you need to know to buy your first word processor', and more recently *Kevin Viney* looked at **Low Cost Word Processing** in January 1983.

In his **Buyer's Guides** series *Charles Christian* has also cast his eagle eye on **Calcs** in July '83, **Printers** in May '83 and **Games Suppliers** in April '83.

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TITLE	SUPPLIER	PRICE	HARDWARE	MEMORY	PROGRAM INTERFACE OPTIONS
APPLEWRITER II	Apple Dealers	Around £40	Apple II	48K RAM + essential to have 80 column VDU card for earlier machines. This should not be necessary with the new Apple IIE.	Currently none
EASYSCRIPT	Commodore approved dealers	£75	Initially designed for the Commodore 64	64K RAM CPU	Currently only 'EASYSPELL' but more promised for later this year.
EASYWRITER	IBM (but confusingly there are other versions)	£153 – £226	IBM-PC	64K RAM CPU minimum	Should be a variety of IBM packages available in the UK by mid-summer including 'EASYSPELLER'
PEACHTEXT	**Peachtree Software Ltd** 43/53 Moorbridge Rd Maidenhead SL6 8LT Tel: 0628 32711	£250	Available for wide range of CP/M machines, also IBM-PC	Minimum 48K RAM CPU and recommended disk storage 2x160K drives	Yes, various Peachtree Office Productivity tools (or POPs) including a spelling checker and a mailing list manager, at about £100 each
SCRIPTSIT	Tandy Computer Centres	Varies – £179 for TRS-80 Model II (64K)	The whole Tandy range	Minimum 48K RAM CPU. Interestingly enough there is a cassette-based version still available	Various Tandy spelling checker, address and mailing list programs
SELECT	**Bonsai** 112-115 New Oxford St London WC1 Tel: 01 580 0902 plus ACT dealers	£295 – £375	16-bit computers including IBM-PC and the ACT Sirius	128K RAM CPU minimum plus will support hard disk mass storage	None, so far, but some promised for near future
SPELLBINDER	**Encotel** 7 Imperial Way Croydon CR0 4RR Tel: 01 686 9687	£275	Most CP/M systems and also on the IBM-PC	Recommended minimum 64K RAM CPU	Has built in mailing list sort facility and can be run in conjunction with 'SPELLCHECK'
SUPERSCRIPT	**Precision Software Ltd** 4 Park Terrace Worcester Park Surrey K4 7JZ Tel: 01 330 7166	£249	Most modern Commodore computers including CBM 700	32K RAM minimum CPU	'SUPERSPELL' spelling checker
WORDCRAFT	Commodore & VIC dealers	Around £125 – £350 depending on configuration	Most Commodore computers from original PET and VIC-20 upwards	Ideally 32K RAM – is available in disk, cassette and cartridge based formats (for VIC-20)	None
WORDPRO I – V	Commodore Dealers	£250 – £350 depending on version	Most Commodore hardware	32K RAM CPU – System also includes a ROM chip to fit into vacant slot on main board	None
WORDSTAR	**Telesystems Ltd** PO Box 12, Gt. Missenden Bucks HP16 9DD Tel: 02406 5314	£295 (or £510 for complete WP, mailing list and spelling check package)	Most CP/M computers, also IBM-PC	64K RAM CPU absolute minimum because of extravagent way it handles data	Numerous including 'MAILMERGE' 'SPELLSTAR', 'CALCSTAR', DATASTAR and 'SUPERSORT'

TOP TEN WORD PROCESSORS

PRINTER OPTIONS	MATHS FACILITIES	SIMULTANEOUS PRINTING & EDITING	VISUAL INTEGRITY	COMMENTS
No special print characteristics, but will interface with a reasonable number of printers including Qume and Centronics	None	No	No	Generally regarded as clumsy to use and easy to hit the wrong keys. On the other hand what do you expect for £40? "Cheap and cheerful" is the general verdict. Historically this is now quite an ancient system, however the launch of the IIE and the promised 'Mackintosh' should see a revival in its fortunes and possibly an updated version being introduced
Has some special print features but will only interface with CBM compatible printers	None	No	No	Still early days with this new package and its attraction is very much linked in with the success or failure of the Commodore 64 system
Most parallel and serial interfaced printers catered for plus extensive special print facilities	None	Yes, spooling no problem	Yes	Although this is the standard IBM-PC WP package there are complaints that it is cumbersome to use. It is strongly rumoured that it may be replaced by PEACHWORD or possibly the newly launched VIZIWORD later this year
Will run on a wide variety of printers and, depending on the type, can offer underlining, emboldening and different type faces	Yes, – some mathematical facilities including addition and subtraction	Can print one file whilst another is being edited	Yes, but according to some commentators this is not easy to achieve	This used to be known as "Magic Wand" and is rumoured to become the approved WP package for the IBM-PC
Compatible with all Tandy compatible printers but does not have many extra features, e.g. cannot print vertical lines, therefore restricts use with accounts work	None	Spooling available	No	A very popular, well tried and tested system available in a number of different versions. However according to some commentators the use of the general purpose keyboard involves some particularly cumbersome routines
Reasonable number of printer-type options plus has facilities for emboldening, underlining and proportional spacing	None	Yes	Yes	As well as being offered for the IBM-PC 'SELECT' is also available as the definitive WP system for the Sirius via ACT and their 'PULSAR' software range
Will interface with most printer types and special facilities include proportional spacing	Yes, some facilities including addition and subtraction	Yes	Yes, or as the handbook puts it – 'you bet'	One criticism is that the program is much easier to to run if you have a specially configured keyboard
Will interface with a fairly broad range of printers and can manage emboldening and underlining	Yes, can manage some arithmetic functions	Yes can handle background printing and spooling	Yes	Although subject to the limitations of the CBM keyboard, Precision Software hope that their package will become the definitive CBM WP package
Most parallel plus serial printers and can manage underlining and emboldening	None	Some spooling on disk and cassette versions	Yes	One of the original Commodore WP packages. On the other hand it is relatively cheap for the smaller systems and is well and truly debugged
Has some print specialities and will run on a variety of printers providing appropriate interface hardware available	Some, can add and subtract	Yes	Yes	Another Commodore 'golden oldy' with relatively limited capacity. It also involves unbelievably tedious multi-function key pressing routines to select various program options
Will interface with almost any printer and can manage underlining and emboldening, but not usually proportional spacing	None, but it will interface with 'CALCSTAR'	Simultaneous printing and editing only possible after spooling to disk first	Yes	This program from Micropro is arguably the most successful WP package available to date. Also because it is virtually an 'industry standard', plug-in dedicated keyboards are available for it

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THE FRENCH CONNECTION

Footfalls of the mythical 1984 echo along the corridors of power. Sinister whispers catch the breeze and never quite disperse. The French – *they* have dared probe deeper. Velizy and Marseilles have recently been flooded with 4,000 micros in an investigation into the implications of having a computer in every home. The question they are seeking to answer is: "what would People do with a computer if they had one?" *Rex Malik* investigates.....

Every year, it is traditional in France for the President to make, or otherwise issue, a New Year message. Francoise Mitterand proved no exception and this year, among other things, he spoke on the theme of industrial development in France. He listed four items: The Train Grand Vitesse, the Airbus, satelittes, and, here it comes, the personal computer.

He is surely the first head of state to publicly recognise, in such an important speech, that personal computing exists. It was not a throwaway: the French are planning a society in which personal computing is as ubiquitous as electricity, water, the car, and the telephone.

Evading Britain's winter, I have been taking a close look at those plans. A simple list of the projects in hand, that I know of, would be enough to fill this issue, so I am going to concentrate on just two aspects: *The Centre Mondial pour L'Informatique et les Resources Humaines*, which translated is the World Centre for Computer Science and the Development of Human resources, and the videotex experiment at Velizy.

The Centre Mondial, as it is popularly known, was set up on the initiative of former journalist, author, and French politician Jean Jacques Servan Schreiber; best known outside France as the author of two books: *The American Challenge*, and *The World Challenge*.

The theory behind the centre is that the under-developed third world could probably do a leap frog from its present pre-industralised state to the so-called information age, if the systems were properly devised and made available cheaply enough – thus breaking the historical pattern:

agrarian → industrial → information

That is one strand. The other is that the industrialised world itself will be permeated by microcomputing, thus it is essential to address the question: 'what sort of systems will people use and what will they use them for?'

As you can see, the canvas is broad, broad enough to enable those involved to work on roughly whatever the mood takes them. And that of course is a problem.

But first, the politics. JJSS – as he is popularly known

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in France – while reseaching *The World Challenge* fell in with Nicholas Negroponte and Seymour Papert, both professors at *MIT*. The first is best known for his work on communications and graphics; the second created the language LOGO, and is one of the world's most outstanding teachers.

Papert and Negroponte were partly responsible for the evolution of JJSS's thinking, which eventually resulted in the creation by the French government of an international centre specifically intended to do research aimed at the ends noted above. But the centre is not simply doing research as it is normally conceived of; it is to run large scale test projects. These projects are to date scheduled to be in France, in Marseilles; and in Africa and Latin America respectively, in Senegal and Colombia.

The centre was approved of by the French government in late 1981, and began to come into being last year. It began initially with a budget of under six million pounds, and will have about double that this year. It collected staff rapidly, seventy professionals within less than a year and it is scheduled to develop to a staff of 110 by the end of this year.

President Mitterand ...is surely the first head of state to publicly recognise, in such an important speech, that personal computing exists.

Its beginning was truly international, around half the professionals were foreigners, mostly American. But it was financed solely by the French government and that ensured, say the sceptics, that it was unlikely to remain independent for long. From being a free wheeling organisation solely concerned with advancing technology and its use, it has now, say its critics, become an instrument of French policy. Initially it was under the Ministry of Research & Industry, but since last autumn it has been moved under the control of the DGT, which provides part of its budget. The DGT runs French telecommunications, and is the most commerical and wide awake of French government organisations.

The centre has now been prohibited from ordering whichever microcomputers it wants, as most of those immediately available were American. Instead it was told to await French machines, even if those machines should be in part of American origin but made in France. Whatever the truth of all this, it was enough to lead both Papert and Negroponte to resign, though the latter does not leave till this summer.

That's the background. But what does the centre actually do? Basically it does research into the relationship of computing and people, what do the untrained want from computing and what needs to be changed in computing to enable them to get it.

In a brilliantly inspired move, if an expensive one, it has been sited in a high rent district in the centre of Paris, one that is accessible to all. The foyer is large and full of micros, and those micros are in use: the only words to use are those old ones about a hive of activity. People walk in off the streets to find out about computing. The result is of course, that the place is full of kids doing everything from space invaders to learning the fundamentals of programming.

Upstairs, research is going on into many things. Including language research into naive user dialogues. The centre is committed to LOGO for much of its research both in France – where the French government has picked LOGO as the primary language for use in the elementary and secondary education system, – and abroad; indeed in the Senegal experiment, LOGO has been translated in *Wolof,* the local language. Nonetheless, the centre is also pursuing PROLOG, or PROgramming by LOGic; a language under development for Vth generation computers of the 1990's which will permit "the programmer...to write his statement ▷

THE VELIZY EXPERIMENT

Trials of the French videotex system *Tele-tel* began in the summer of 1981, though some users had received terminals earlier. The French installed more than 3000 videotex terminals, VDU's with alphanumeric keyboards linked to a phone line, into an area called Velizy just outside Paris.

The French system differs from Prestel in that the databases are not all stored and updated by the telecommunication authority's own mainframe, but on computers belonging to Commercial Information Providers (or as the French prefer to call them, Service Providers).

By the time the trials were well under way, there were over 190 of these SP's, though many of them shared systems. Although there were over 3000 terminals, the research base was some 2200, the rest being used by SP's, the French Telecom equivalent, and others involved in monitoring the experiment.

300 of the research base terminals were also equipped with magnetic 'cashpoint-like' card readers, permitting owners to use the French 'smart card'; a card with an inbuilt microprocessor, which enabled them to do banking transactions from home and handle some other financial transactions, particularly in the mail order field.

The trials were slow to build up, partly because some of the services were not available until quite late in the experiment. However, for the last fifteen months, every videotex call made has been logged, and the first nine months of those calls have now been analysed in detail.

The analysis shows that:

- The average family made between 6 and 8 calls a month. (The analysis made public breaks the data down into months). The heavy users, in the main from executive class families, averaged between 14.8 and 16.2 calls a month.
- It was assumed from the early days that videotex users would go to the mainframe system to make specific enquiries and having received the answer would then switch off. This has not been the case. What happens can only be described as electronic browsing with users going to between two and three services a call.
- The call length averaged nearly fifteen minutes and if the preliminary data on the later stages of the trial is to be believed, call length has been going up to between 15 and 20 minutes.
- Frames accessed during each call averaged 47, which is surprisingly high.
- Around two thirds of the households used the system more than once a week.
- Unlike Prestel with its keypad, the French approach of going ahead with a full alphanumeric keyboard made it possible to introduce a message service. This started quite late, even so it was a runaway success. To use it you had to subscribe, although subscription did not involve any extra charge.

That service, called 3MV, finally had more than 1800 subscribers. The service allowed users to send messages to each other, to form common interest groups and to look at bulletin boards.

At one point there were over 340 common interest groups formed by users, of which over 100 were serious in that they carried regular traffic. At the end of the period analysed, the system was carrying 1500 messages a week. The messages were not free either, call charges had to be paid and so did charges for sending or storing a message, which meant a minimal message cost, the equivalent of 10p.

- Videotex traffic seems to have three weekday peaks, 1 pm, 11pm, and a main peak around 7 pm. The busiest day was Saturday, but everybody seems to go quiet over Sunday lunch.

As I write, the last six months of the trials, which ended at the end of December 1982 are being analysed. Rough preliminary data discussed in Paris in January indicates that the figures given have either held up, or been bettered. ○

THE MARSEILLES EXPERIMENT

Many recent experiments, and indeed the Velizy Experiment, have been held in relatively new districts and towns. Such areas have little distinct history or custom; buildings and infrastructure are modern which makes it easier to introduce new services and furthermore there are few single or old people; the majority of the population comprise family units with children of school age. Marseilles is different. The experiment will be mounted in an old quarter called La Belle de Mai, parts of which date back two centuries. It is a working class area where nearly half of those employed travel to work on foot.

These factors combine to make La Belle de Mai a stable area, nearly 60% have lived in the same house, and over 90% have lived in Marseilles, since 1968, 82% of them in the same quarter.

The area has a population of 17,000, 20% of whom are over 65, and 15% are 15 or under. There are some 25 schools with an attendance of 3500. The majority of Belle de Mai's workers are employed by the railway, the Post Office or the docks, or are engaged in packing and shipping. The area has lots of small businesses of the latter type.

The area also has twelve active local associations. This is a critical fact in the centre's plans; to flood the area quite quickly with microcomputers, which will be on loan for two to three years. The plan is to inject five to six hundred this year, and bring the number up to 1000 by 1984. The centre will begin by installing computers in the schools (eight of the schools currently have computers, but they are used for teaching as opposed to programming) and in public places. To get one it will simply be demanded that you ask for it and demonstrate a desire to do something with it.

Schools and associations will be used as centres to teach people what the capabilities of microcomputers are, together with some basic programming. It is obviously essential that teachers and enthusiasts are taught first.

And what does anyone expect to get out of all this? I wrote earlier that no one knows what people will do with computing, and that is the starting point of the Marseilles experiment. True, they are working on devising a message system, for they expect much inter-communication. But the real aim of the exercise is to try to discover what people would like to do.

"People," says Georges Chappaz who runs the Marseilles Experiment, "know computing is important. But people do not know what they want computers for."

And how do you find out? The way they have chosen is to go ahead with LOGO, which has been well tested with children and adolescents, but has never really seriously been tested on a large body of adults.

The supporters of LOGO would say that its main application is in learning. So here we are going to have a situation in which some thousands of people closely grouped geographically will over two years be spending part of their time learning.

Or will they? Again no one knows. Still, enough resources are being devoted to the project to monitor and find out what is going on. The budget this year will be around one and a half million pounds, and the project will have 18 full time researchers. The systems will in the main be French, Thomson 07s, Texas 99/4As, plus a few Apple's.

I am quite aware that the details I have been able to give are scanty. This was not because I did not ask the questions, it is because there are as yet no answers. Nobody is even sure exactly how they are going to do all this: they will discover as they go along. All they do say is that 1000 computers in a small community allows everyone access, and, that they expect surprises.

I hasten to add that – no, this is not another example of a group of testers forcing a technology and its routines onto uninterested people. There has already been immense collaboration with the community, and that will continue.

It may well be that the experiment will be a flop. On the other hand, it could just as easily go the opposite route. Either way, this writer will be watching and will report again as the experiment progresses. ○

and not have to pay attention to the machine". (See: **The Japanese/and a thinking micro:** *MicroComputer Printout* November 1982). Alan Colmerauer, one of PROLOG's creators, is currently working with the centre.

They are researching simple digital applications of videodisks, (see: **Does Your Micro Need Video Disk?** *MicroComputer Printout,* August 1982) working on medical databases for non specialists, and of course trying to work on the problem of creating a reliable microcomputer which is weather and 'idiot' proof; the sort of machine that you could take into a community in an underdeveloped country and then expect to work with only minimal servicing, because the servicing infrastructure will just not be there. This does not mean to say that the centre is doing hardware research, that function it is generally agreed has to be done elsewhere.

They are trying to work on the problem of creating a reliable microcomputer which is weather and 'idiot' proof.

What excites this writer, however, is a piece of work which does not seriously start till this autumn. It is **The Marseilles Experiment**; a field trial on a substantial scale. It is recognised that computing will eventually become a mass activity, not so much a pastime as a dependency. We will use our micros not just for fun, but as a tool; a tool for accessing and contributing to the information society.

That last sentence may sound a little cliche ridden, but as a statement of general belief it is not exceptional.

OK: so answer me one question: What will people do with it?

The truth, quiet simply is that no one knows. But two fascinating experiments launched by the French have begun to uncover some clues. The first, launched in the summer of 1981, and called **The Velizy Experiment**, was concerned with the replacement of pre-computer systems with computerised methods and communications. The second, **The Marseilles Experiment** is due to begin this year. ○

...ET LES ANGLAIS

Milton Keynes is our nearest equivalent to the Velizy Experiment. Like Velizy it is a new development with a modern infrastructure and a young population, making it an ideal testing ground for new technology.

The 'origin' of Milton Keynes as a centre of new technology owes more to chance than judgement. As early town planners set to work, the decision was made to keep the skyline free of an ugly mass of TV aerials. Thus along came British Telecom and connected over 22,000 homes with coaxial cable; cable... the magic word that has since opened up so many possibilities. Hence the aim is now to establish Milton Keynes as "the most advanced centre in Europe for the *practical* application of the new technology", to quote Jane Chapman of the Milton Keynes Development Corporation, the Quango co-ordinating the project.

The difference between Milton Keynes, and Velizy and Marseilles is that the latter have been planned, orchestrated, financed and maintained by the Government; whereas at the moment in Milton Keynes the government role is chiefly that of a catalyst, "we're here to make things happen," said Jane Chapman, "we co-ordinate ideas and have only a limited lifespan ourselves". A proposal is however currently with the Department of Industry seeking funding for the planned Viewdata system (a localised Prestel). We will be reporting in detail on events in Milton Keynes in future issues. ○

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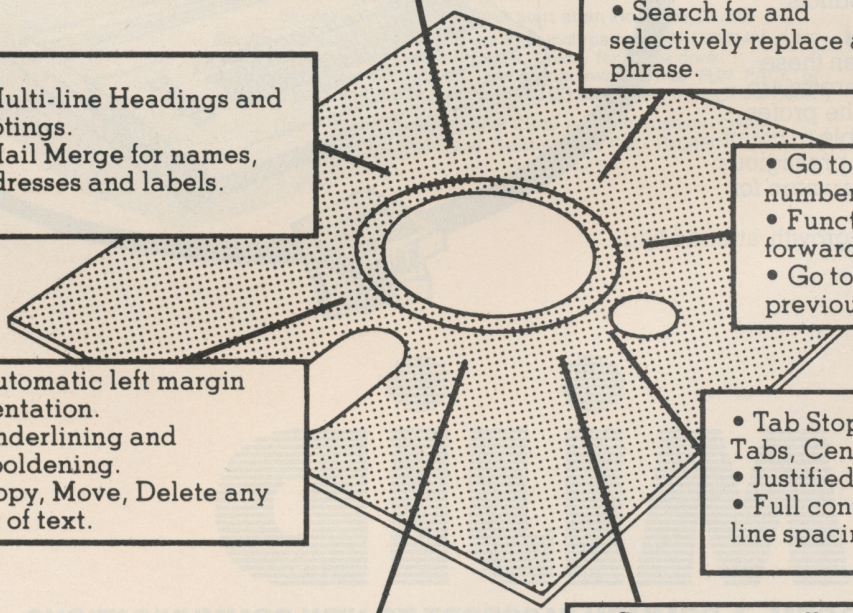

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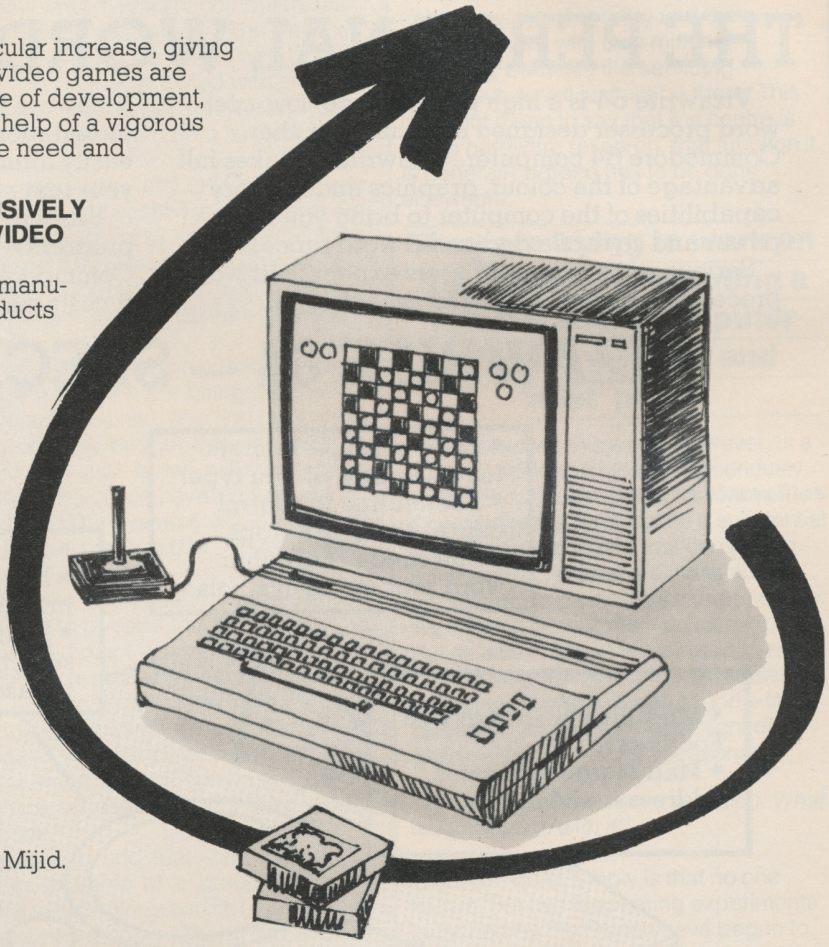

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EXPERT'S CHOICE

LOGO

LOGO is not just another computer language – it is a philosophy of education that could spell doom for our existing school system. *Richard Pawson* examines the controversy surrounding LOGO, looks at how it is used, and catalogues the enormous range of LOGO products now coming onto the market.

One of the most appealing facets of LOGO is the 'Turtle Graphics' system. A small robot (the Turtle) is controlled by the child via a computer's keyboard, using simple commands, from which complex drawings and patterns can be built up.

Those with a 'classical' education will recognise its Greek origins (logos: the *word* or second person of the Trinity). Those with a commercial background will think of a corporate image symbol or trademark. Either way, a *logo* is a symbolic representation of a concept. In our field, *LOGO* is the most exciting development yet in the application of computers to child education, and the name comes from the same origins.

LOGO is not new – researchers and academics have been developing the concept since as far back as the late sixties. But this feature comes at a time when LOGO is gaining recognition amongst the educational community at an unprecedented rate. The BBC recently devoted an entire Horizon programme ('Talking Turtle') to it, and while their rather tabloid 'pop science' treatment of the subject invoked considerable criticism and controversy, it also sparked off a wave of interest from parties who had hitherto been unaware of LOGO's existence. When we came to research LOGO, we were amazed at the number of companies developing and announcing related computer products.

What is LOGO?

So what is LOGO? I hate to start off with negative definitions, but there have been so many articles in the computer press written by hacks who haven't bothered to get into the subject, that I must first correct the three most common misconceptions. First, LOGO is *not* primarily a computer programming language. Many have noted that a LOGO education does provide an excellent background in structured programming, for those who wish to learn formal languages such as COBOL or Pascal, but that was not its original intention. Second, LOGO is not primarily intended to introduce children to computers, as worthy a motive as that may be. Thirdly, LOGO is not primarily a computer graphics facility. All these three areas are really spin-off benefits from the LOGO idea.

"LOGO," to quote from Harold Abelson's book on the subject, "is the name for a philosophy of education and for a continually evolving *family* of computer languages that *aid* its realisation" (my italics). That philosophy is most clearly presented in the book *Mindstorms* by Professor Seymour Papert who, based in the Massachusets Institute of Technology, has been one of LOGO's chief designers and protagonists. Most of the inspiration for this article comes from his book, which I would commend to anybody, though even after two months extensive research, I cannot claim to reproduce his arguments with anything like the same clarity or conviction.

Much of Papert's argument is derived from the work of the eminent Swiss educational philospher Jean Piaget – with whom he worked for some while. Piaget maintained that given the right opportunities for exploration, children will learn things naturally up to their limit of understanding, which obviously increases constantly. Most of the facilities which we need to live (walking, talking, eating, etc.) are learned in this way, and Piaget argues that what we think of as 'academic' subjects can be learned in exactly the same way provided there is a similar kind of learning environment.

Piagetian learning

Unfortunately, our educational system is not geared towards Piagetian learning, but rather toward 'programming' children with knowledge. In part this has arisen from constraints on resources of time and money, but really it is more from a lack of understanding of how children learn. By way of proof for this diatribe against teachers, Papert cites the introduction of the computer into schools, which should remove many of the constraints on resources. Yet in 99% of all cases, the computers are being used either to teach 'computing', or for traditional Computer Aided Learning (CAL) applications. The latter is a particularly explicit example of anachronistic teaching methods applied to modern technology – the computer is little more than an electronic page turner and score keeper. The computer is programming the child when it should be the other way around.

Marking and scoring is perhaps the worst element of our educational system and is one of the main reasons why at an early age we learn to brand ourselves as non-mathematicians, or non-musical or non-sporting etc. *Mindstorms* uses many examples from the field of mathematics, simply because the fear of mathematics is widely recognised as a common product of our system. Papert, however, uses the term 'mathophobia' which from the Greek origin means fear of 'learning' in a general sense. "In our culture, fear of learning is no less endemic (although more frequently disguised) than fear of mathematics." Clearly Papert himself does not have this problem, and views learning as a hobby – having taught himself thermodynamics, reading Chinese, flying, cooking, juggling – a polymath in the true sense of the word.

Fear of learning

Most of our adult fear of learning stems from the fact that most of our own school-based learning was dissociated from reality. Marking is but one example: the immediate reaction of a child on being told that his answer is wrong is to forget about it as quickly as possible and move on to something else. In real life, when something we do is not correct, we go back and find out where we went wrong, and learn how to do it correctly. Though clearly an idealist, Papert is far from being just a theorist – he quotes many examples of his own involvement with teaching children. My favourite is of the small boy describing how you learn mathematics: "You just have to make your mind go blank and then say it to yourself over and over again until you remember it."

In short, we have divorced the learning process from what is being learned, when in fact they are inseparable. We teach multiplication in the same way that we teach the capital cities of the world, though our usage of the two is completely different. The same is true of English or music or sport. "The important thing is not to teach children mathematics but to teach them to be mathematicians" – not just to learn, but learn how to learn.

Now to anyone who has read up on Artificial Intelligence or Expert Systems, this should be sounding familiar. One of the fundamental principles of AI is that items of knowledge are handled in the same way as rules that relate to items of knowledge. For this and other reasons, LOGO (which is nothing more or less than an attempt to use the resources of a computer to create an environment for Piagetian learning of many disciplines) has sprung mainly from the loins of AI.

Set of tools

LOGO is essentially a set of tools or 'devices to think with'. In the foreword to *Mindstorms*, Papert reminisces on how he used the mechanical principles of gears as an aid to understanding and learning a whole variety of new topics as a child. The floor Turtle (see panel) is a very tangible device with which to think. As they learn how to instruct the Turtle to produce the graphic designs of their imagination, children frequently act out the movements of the Turtle themselves. Learning becomes reality because they identify with it.

Turtle graphics is only one small aspect of LOGO, and indeed only applicable to the teaching of certain subjects, such as regular plain geometry. Other disiplines need other devices – one implementation by the LOGO researchers at Edinburgh University made use only of a music box, while others use devices that are represented purely on the computer's screen.

Effects are achieved by typing LOGO commands on the computer's keyboard, and the system has been designed to be as 'transparent' as possible – the child should not really be aware of the computer, but rather only of the instructions he is giving and the effect they are having.

As is explained in the panel on *Using LOGO*, simple commands are built up into more complex procedures which are then given straightforward names. This encourages children to build on ideas they already understand, and construct more *powerful* tools which are nonetheless no more *complex* to use. Secondly, it encourages the idea of breaking down new problems into pieces that can be understood using existing knowledge.

Microworlds

Perhaps more important, LOGO reflects the language that children themselves use when communicating and pooling ▷

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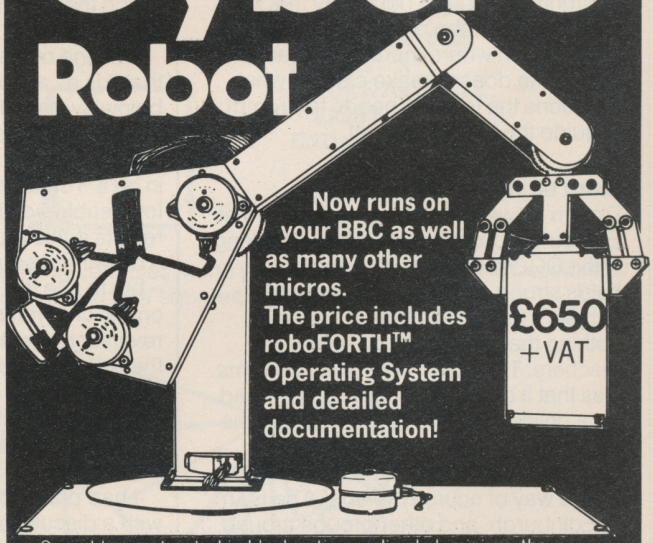

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knowledge gained in Piagetian learning situations. *Mindstorms* features examples of how a LOGO program is built up – together with the conversation between two children who are operating it. The correlation between the two is very convincing.

In its more advanced form, LOGO is a means of creating what Papert terms 'microworlds'. These are environments created on the computer, over which the child has total control, except that everything in that environment behaves accurately and reliably, according to a set of rules built in by the teacher. Newtonian mechanics is a good example of a subject which children frequently have difficulty with learning because it is all blackboard-based. It is difficult to create a physical system that behaves in a Newtonian fashion, but on a computer it's easy. Result: children can *learn* the principles for themselves, rather than just having to *memorise* the laws of motion.

So does it all work? Papert himself has obviously produced some quite outstanding results, particularly in the area of bringing remedial mathematics pupils to a position of strength in that subject. But then, by any standards, Papert is a genius. What of ordinary teachers who have inherited the LOGO philosophy and system, but without the years of background experience that went into creating it? We talked to as many schools and educational bodies who are either using or currently evaluating LOGO, to find out how it works at grass roots level.

Clearly one of the major problems has been that Papert rather glosses over the role of the teacher in the LOGO environment. That is not to say that he is an advocate of the non-directive school of education where there is no teacher, but that he doesn't make clear in what directions the teacher needs to prompt or guide the LOGO student.

Course material

Dr. Jim Howe of the Department of AI at Edinburgh University, has been working with LOGO for over twelve years and holds strong views on this particular subject. "Papert like Piaget has said nothing that is of practical value to teachers. The main merit of *Mindstorms* was that it convined people of the need for a philosophy of education." With the exception of a few small publications such as *LOGO Challenge* there is little an the way of course material. The team at Edinburgh, and other groups around the country, are nearing completion on a set of worksheets and teachers notes to accompany one of their own versions of LOGO.

"LOGO is a bit like Meccano;" says Howe, "it is a kit of parts. When a child first encounters Meccano, he uses the Meccano manual to build standard objects that have been designed for him. As he progresses, he can add his own embellishments or variations until he is confident enough to throw away the manual. The hardest thing is to come up with the right kit of parts – LOGO has achieved that much."

Dr. Howe believes that the younger children should not be exposed to the primitive commands of the language, but rather to more complete structures which have been built up for him. A young child's model aeroplane kit may consist only of two wings that snap onto a fuselage, but it is by that means that he learns eventually to design and build his own models from raw materials like balsa wood and tissue paper (my analogy!).

Problem solving

Howe himself used LOGO in a class of 10-12 year old remedial maths students, teaching not just geometry, but the more difficult algebra too. He reports that roughly half the pupils made reasonable gains – in some cases out-performing a 'control' class of pupils.

Another school we spoke to already had three floor Turtles and were aiming for one system between two pupils. They are using LOGO primarily to teach problem solving, though not through traditional programming, which they felt involved too many concepts for the average student to learn. The result is that all of the class has accepted the computer, because they can so readily identify with the Turtle.

All the teachers we interviewed talked of unexpected results or side-benefits. Despite the precision of the Turtle, for example, you do get some slippage on the paper. One teacher told us how the children had without prompting turned this to advantage – producing images which they felt "looked more three dimensional".

But one of the beauties of LOGO is that it is as applicable to children of below average learning ability as to the bright ones. After my research was finished, I was privileged to be able to sit in on a 'Turtle' session at a special school for disabled children. In our terms, the results achieved were extremely limited – drawing a square, or perhaps a house – but to see the expressions of delight on the children's faces was a whole new revelation. Most of all it brought home the fact that one of the chief effects of a LOGO learning environment is that it encourages children to communicate: ideas, theorems, and practical experience.

I had planned to finish this article with a discussion on the future of schools in the light of this new philosophy of education. Papert raises many questions in this vein at the end of *Mindstorms* but doesn't claim to answer them – so it would be extremely pretentious of me to try. I have tried to present the LOGO philosophy and a look at the language itself. Now I want to hear your opinions – can LOGO work? *Will* it work? Or, to draw again from my 'classical' education is it just much ado about nothing? ○

USING LOGO

The Computer language LOGO is intended to provide a suitable environment in which children can learn subjects like mathematics and music in the same, natural way in which they learn to walk and talk. What follows is a brief description of LOGO's features and what it is like to use.

In the main part of this article, we have examined the philosophy behind LOGO, and the radical changes in our eductional system which it demands. But what is LOGO actually like to use? The description below will, hopefully, give you a brief insight into the world of LOGO, though a system which is primarily *interactive* by nature can never be fairly represented on paper.

It must again be stressed, that LOGO was not primarily intended to be a programming language, so to compare it in terms of efficiency and power with, say, BASIC or COBOL would be to miss the point. Nevertheless, some of the structures and facilities of LOGO will be familiar to programmers with experience of many different languages.

Procedures

LOGO is, for example, essentially a *procedural language*. It comes with a limited set of simple commands called *primitives*. The child can build these commands into a simple routine or *procedure* to perform a useful task – draw a box, for example. He can then give this procedure a name – BOX perhaps – and can call upon that procedure again simply by typing 'BOX'. These procedures can themselves be used as building blocks for other procedures, so that BOX and TRIANGLE might form HOUSE, and so on. The idea is that the child learns to build quite complex ideas from simpler ones, and conversely learns to break down a problem into more manageable pieces.

Logo is also highly *interactive*. Typing the word 'Box' would create a Box on the screen immediately – with no need for the procedure to be compiled, listed or even RUN. The child is completely shielded from the normal operation of a computer. He is merely exploring a *microworld*, an environment with rigid rules and boundaries which have been set up using LOGO.

Lists

In addition to handling numbers and strings of characters and variable pieces of information, LOGO is also equipped to handle lists – made up from numbers, names or even other lists of data – and treat them as single entities. This aspect of LOGO really grew out of the language LISP (LIS Processing) which was developed primarily for Articifial Intelligence (AI) applications, where lists of possible responses and 'matches' (matching an input to list of entries that are acceptable) are constantly shuffled around.

The best example of LOGO's use of lists is the ANIMAL program cited in many of the books on LOGO. You have to think of a particular animal, and the computer has to 'guess' which it is by asking questions to which you can answer YES or NO. The program starts off very dumb, but learns with each run of the game. This is actually a crude form of an 'Expert System' (see *MicroComputer Printout, December '82*). Here is a sample run, early on in the learning curve, with the computer's responses in italic.

IS IT A MAMMAL?
YES
DOES IT BELONG TO THE CAT FAMILY?
NO
IS IT A DOG?
NO
I GIVE UP – PLEASE TELL ME
AN ELEPHANT
PLEASE GIVE ME A QUESTION FOR WHICH THE ANSWER FOR ELEPHANT IS 'YES' BUT FOR A DOG IS 'NO'.
DOES IT HAVE A TRUNK?
THANK YOU – DO YOU WANT TO PLAY AGAIN?

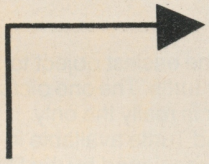
Programmers will recognise this as a 'tree' structure which is being continuously modified – quite a task in, say, BASIC.

In LOGO, however, the whole knowledge base is treated as a simple list with just three entries. The first is a question. The second entry, which is persued if the answer was *YES* will either be a guess at the annimal, e.g. *GIRAFFE*, or itself a list, comprising a question and two other entries. Similarly, the third component on the original list will either be a guess for the anwser *NO* to the question, or another list of three elements to be persued.

Recursion

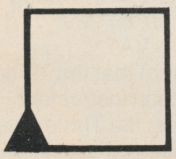
This brings us on to a fourth powerful attribute of LOGO – *recursion* – a difficult concept to explain at the best of times, and the stuff of nightmares for programmers in most languages! Recursion is the ability of a procedure to call itself – which may sound rather like disappearing up your own ... well, you know what I mean. The point is that many real problems can, with the

TURTLE GRAPHICS



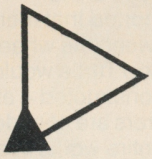
```
FORWARD  100
RIGHT  90
FORWARD  150
```

All LOGO routines are constructed ultimately from 'primitive' keywords, such as the two used here for moving the Turtle. The triangle indicates the position and orientation of the screen Turtle at the end of the routine.



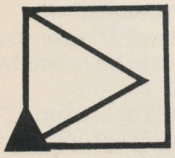
```
REPEAT  4
  FORWARD  100
  RIGHT  90
```

We can make use of the REPEAT primitive to save writing the same instructions several times.



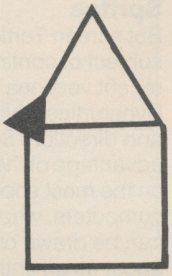
```
TO TRIANGLE
REPEAT  3
  FORWARD  100
  RIGHT  120
END
```

We can give a name to any procedure, such as TRIANGLE here, or SQUARE for the previous example. These can be activated within a program or direct from the keyboard simply by typing the procedure's name.



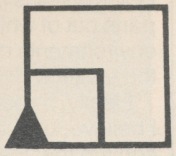
```
TO HOUSE
SQUARE
TRIANGLE
END
```

Procedures can be the building blocks to larger procedures. Our HOUSE program contains two bugs: The roof is on the side, and inside the house. LOGO introduces children to the concept of 'putting things right' or debugging at a very early age. This is in sharp contrast to the disheartening traditional schooling methods where everything the child does is marked either 'correct' or 'incorrect'.



```
TO HOUSE
RIGHT  90
SQUARE
LEFT  60
TRIANGLE
END
```

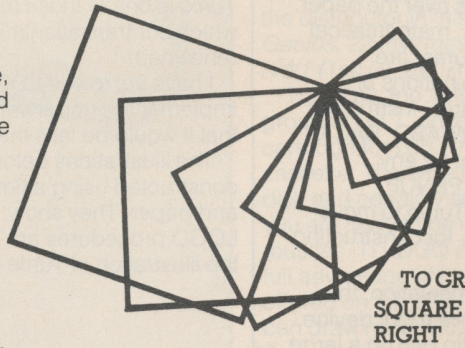
By 'acting out' the movements of the Turtle, it is easy to see where the mistakes have been made and our house is speedily constructed!



```
TO SQUARE : SIZE
REPEAT  4
  FORWARD : SIZE
  RIGHT  90
END

SQUARE  100
SQUARE  50
```

By using variables in the procedure definitions, it is possible for example to draw squares of different sizes.



```
TO GROW SQUARES : SIZE
SQUARE : SIZE
RIGHT  20
GROW SQUARES : SIZE + 5
END
```

Using recursion, a procedure can call itself – providing a concise way of expressing a complex program. This lends itself to certain types of problems. Our run here had to be terminated before the screen was filled. ▷

application of a simple operation be reduced to a smaller problem of an identical nature and so on.

For example, drawing a child's tree could be stated as follows: draw a trunk and two branches, then draw a smaller version of this simple tree on the end of each branch... and so on... This is a recursive procedure. Let's look at another problem – sorting a list of one hundred values into descending numerical order. Using traditional methods, it would take ages to teach a child an algorithm for sorting; using recursion it's a cinch – the child could probably come up with it without prompting. In plain English it would read: To sort a list of one hundred values, find the highest value, place this at the top of the list and then sort the remaining ninety nine! In LOGO this might read:

```
MAKE " LENGTH: 100
TO SORT : LENGTH
HIGHEST : LENGTH
SORT : LENGTH – 1
END
```

Where HIGHEST is a procedure which looks for the highest value in the elements one to LENGTH and then places that value at the top. Programmers who argue that this is not efficient use of a computer, have missed the point that LOGO is not designed to teach children to program the computer, but to teach them *to learn how to solve problems.*

Turtle Graphics

I have deliberately left the discussion of LOGO's most immediately striking feature, Turtle Graphics, until last to correct the myth that LOGO grew out of the latter. In fact, Turtle Graphics was added to LOGO by Prof. Seymour Papert, and has subsequently been adopted by several other programming languages such as FORTH and PILOT. Turtle Graphics, however, most succinctly embody the philosophy of LOGO and have the widest and most immediate 'appeal'.

Turtle Graphics derives its name from the Turtle – an animated object that is moved by commands typed in to the computer's keyboard and which draws a line as it moves over the paper. Geometrical structures, mathematical shapes and pretty pictures, are constructed with combinations of commands or procedures, instructing the Turtle to move FORWARD, BACK or TURN around a point by any specified amount. The PENUP command permits the Turtle to move without drawing a line – for constructing separate images.

In the original implementation, the Turtle was a small mobile robot device, which drew with a felt-tip pen on a large sheet of paper laid out on the floor. This is still the best kind of Turtle for use with small children because they ran readily identify with it – LOGO's inventers make frequent reference to the way in which children 'act out' the movements of the Turtle themselves whilst developing procedures. This level of involvement is in marked contrast to the abstraction of most teaching methods. To the original model have since been added devices to produce sound and to detect collisions between the Turtle and surrounding objects – thereby opening up microworlds other than just mathematics.

However, most contemporary installations of LOGO, make use not of these 'floor Turtles' but of the 'screen Turtle' – which is simply a triangular shaped image which moves about the computer screen in the same way as a floor Turtle would on the paper. A screen Turtle requires no additional (expensive) hardware, nor does it require setting up each lesson, or a large area of floorspace, and has the obvious advantage that it is possible to change the colour of the line being drawn with a simple command. The disadvantages are that the computer's display resolution means that the lines drawn aren't as smooth as on paper, and the screen image is less identifiable to a small child.

Sprites

But screen Turtles, too, have been the subject of continuous improvement, and recent versions of LOGO include Dynaturtles which can be given speed and direction. Some even take advantage of the 'Sprite' graphics offered on the most sophisticated home computers, whereby graphic objects can be drawn on the screen and moved about as an entity.

Though the Turtle Graphics can be used to 'illustrate' any educational concept, their primary application is the teaching of regular plain geometry. As the authors readily acknowledge, other disciplines require different sets of tools. LOGO itself is nothing more than a kit of parts out of which different learning environments can be constructed to suit the subject.

Finally, if you're wondering *why Turtle*? I believe, but have been unable to confirm that the device started life as a *Tortoise* and in Britain! The idea was exported to the USA, where it was developed and publicised. The term *Turtle* is one of those misnomers for which our transatlantic friends are renowned.

I have yet to see LOGO programming implemented underwater, but suspect that it would be less than successful.

The illustrations below were constructed using a time-honoured pen and paper. They show, however, how LOGO procedures are built up, using the illustration of Turtle Graphics. ○

LOGO PRODUCTS

Interest in LOGO is growing rapidly – as is the range of LOGO products now coming to market. Here's a quick run down of the ones we've unearthed, and news of quite a few about to arrive.

If you've read the rest of this article, you should already be itching to get your hands on a LOGO system, perhaps using the Turtle Graphics to bring out the mathematician or artist you never knew you had in you! Well if so, here's a quick run down of the various LOGO products which we've unearthed, and notice of a few more that should come into the shops later this year.

Floor Turtles

Let's begin with the easiest object to identify – the floor turtle. The one pictured on our front cover is really the only purpose-designed Turtle available in the UK as it was commissioned by the Dept. of Artificial Intelligence at Edinburgh University who have developed and perpetrated the LOGO philosophy since the early 70s. The turtle is manufactured by: *Jessop Electronics, Unit 5, 7 Long Street, London EC2, (Tel: 01 739 3232)*and costs £350 + VAT.

The cost lies in the fact that the Turtle is of necessity a precision instrument. When drawing a square, the Turtle must arrive back in the same position it started from and when turning most turn about as single point, or children will be discouraged. Although one of the schools we spoke to reported that there was some slippage between the wheels and the paper, the Jessop Turtle would seem to be very finely constructed – at any rate, the manufacturers are confident enough to expose the entire works in an upturned transparent perspect basin.

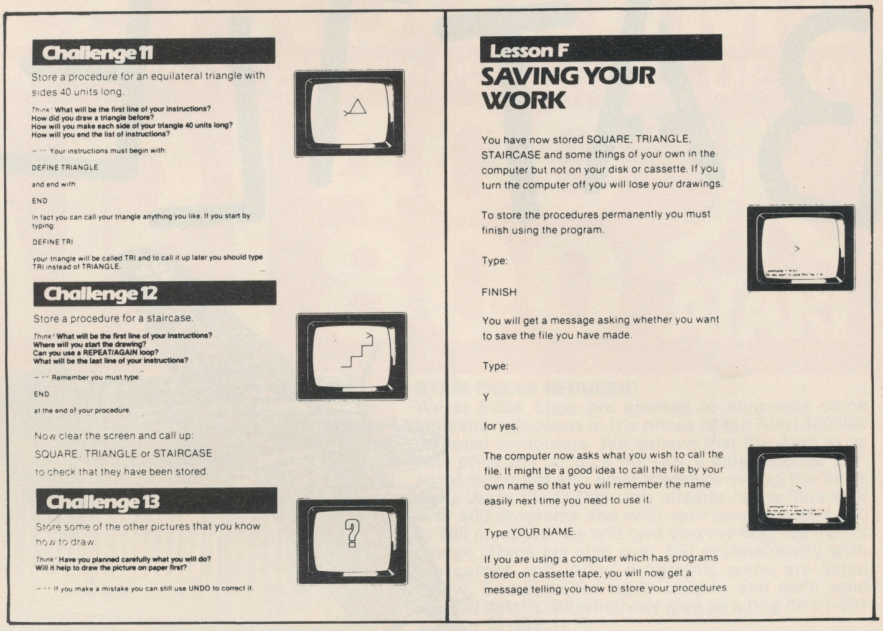
Power is provided with two geared-down motors, which can rotate in the same or opposite directions to achieve turning. Fine control is gained by means of a light-sensor which detects the movement of a cog-wheel. The pen in the centre of the turtle can be raised by the PENUP command.

The turtle is linked by connecting wires to a control box/power supply, and thence via an RS232 interface box to the computer running LOGO.

If you can't afford £350, then there are cheaper alternatives available in the form of simple runabout robot devices that can double up as Turtles – though with less precision. The *BBC Buggy*, for

example, is marketed at £100 by *Economatics, 4 Orgreave Crescent, Dorehouse Industrial Estate, Hansworth, Sheffield, S13 9NQ.* Designed for robot experimentation, the Buggy interfaces to a BBC micro, and is driven by stepper motors. Collision detectors and an infra-red detector for following lines or reading Bar-codes are included, and you can build your own devices onto the Buggy using *Fischer Technik* parts.

An even cheaper solution for soldering iron enthusiasts is the *Zeaker*, available in kit form for £59.95 from *Colne Robotics Ltd, Beaufort Road, Twickenham, Middx, TW1 2PM (Tel: 01 892 8197).* It, too, has all round bumpers to detect collisions, and the Zeaker will interface to any micro with an 8-bit user port such as Sinclair ZX81 or Commodore VIC. However, there is little information as to the accuracy of the Zeaker, or of any software that will drive it so this is strictly for D.I.Y. types.



Challenge 11

Store a procedure for an equilateral triangle with sides 40 units long.

Think! **What will be the first line of your instructions?**
How did you draw a triangle before?
How will you make each side of your triangle 40 units long?
How will you end the list of instructions?

→ → Your instructions must begin with:

DEFINE TRIANGLE

and end with

END

In fact you can call your triangle anything you like. If you start by typing:

DEFINE TRI

your triangle will be called TRI and to call it up later you should type TRI instead of TRIANGLE.

Challenge 12

Store a procedure for a staircase.

Think! **What will be the first line of your instructions?**
Where will you start the drawing?
Can you use a REPEAT/AGAIN loop?
What will be the last line of your instructions?

→ → Remember you must type:

END

at the end of your procedure.

Now clear the screen and call up:

SQUARE, TRIANGLE or STAIRCASE

to check that they have been stored.

Challenge 13

Store some of the other pictures that you know how to draw.

Think! **Have you planned carefully what you will do?**
Will it help to draw the picture on paper first?

→ → If you make a mistake you can still use UNDO to correct it.

Lesson F

SAVING YOUR WORK

You have now stored SQUARE, TRIANGLE, STAIRCASE and some things of your own in the computer but not on your disk or cassette. If you turn the computer off you will lose your drawings.

To store the procedures permanently you must finish using the program.

Type:

FINISH

You will get a message asking whether you want to save the file you have made.

Type:

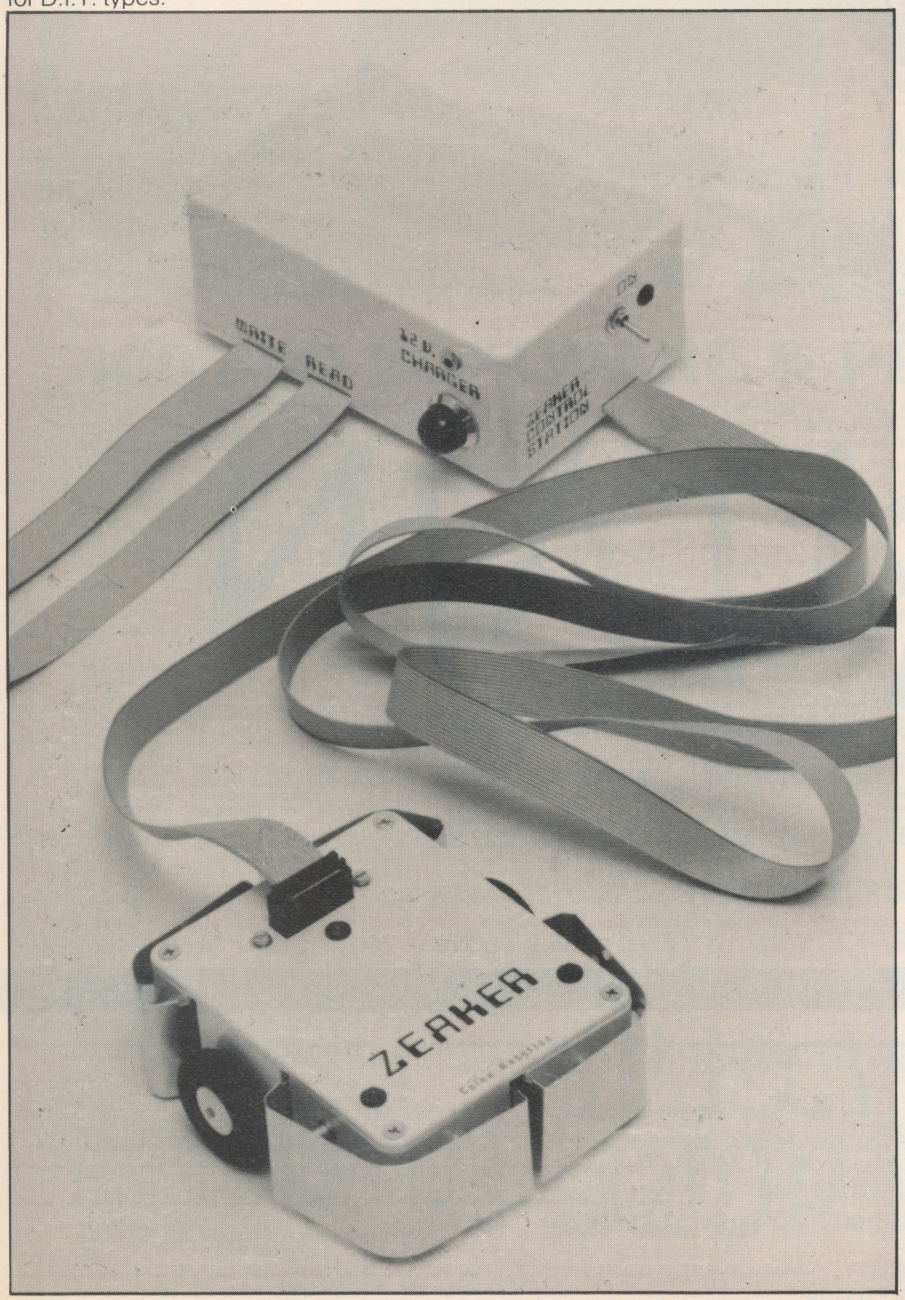
Y

for yes.

The computer now asks what you wish to call the file. It might be a good idea to call the file by your own name so that you will remember the name easily next time you need to use it.

Type YOUR NAME.

If you are using a computer which has programs stored on cassette tape, you will now get a message telling you how to store your procedures



One of the criticisms of LOGO is that there is little in the way of course material or teacher's notes. This spread comes from *LOGO Challenge* published by Addison-Wesley.

Software

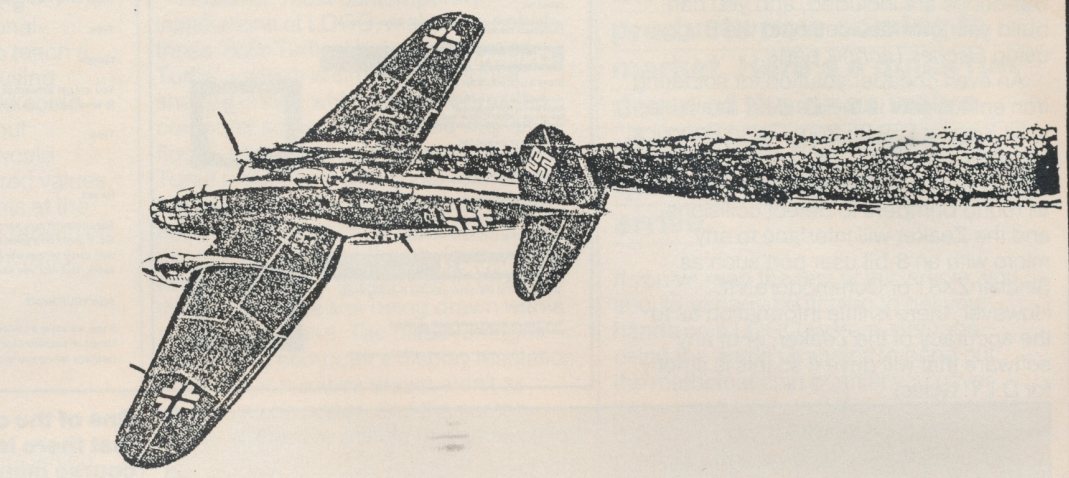
Moving on to actual LOGO implementations, we encountered a confusion of different sources, machines and names. With LOGO only just beginning to gain recognition in schools, many of the best LOGO's are either only just available, or as yet to be released on the public market.

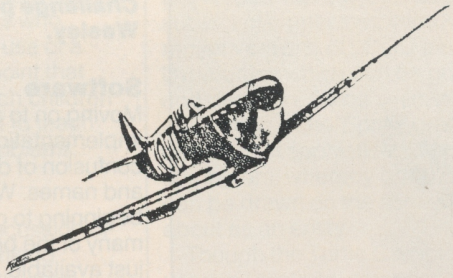
The two most widely marketed implementations available in this country are *Apple LOGO* (from Apple dealers and Edward Arnold Publishers), and *TI LOGO* (for the Texas Instruments 99/4A). The former costs £122 + VAT, and requires an Apple II with one disk drive and preferably a colour monitor. Apple LOGO was developed by LOGO Computer Systems Inc – one of the companies which has grown out of the LOGO project at M.I.T. A slightly different version for Apple is produced by Krell Software and Terrapin Inc. in the States, the distributor in this country being *Little Genius, 22 Inverness Street, London NW1 (Tel: 01 267 7679).*

TI LOGO, too, originated from the group at M.I.T. and comes on ROM cartridge for £85. Though it will work with cassette, TI advise that you really need a disk and certainly some extra memory if you are likely to be writing a lot of LOGO routines. TI LOGO does, however, take full advantage of the 'Sprite' graphics offered on the 99/4A – which means you can draw multicoloured objects and then move them around the screen by

Colne Robotics' Zeaker is considerably cheaper than the Jessop Turtle, but is primarily designed for experimenting with robotics – inaccurate drawing. ▷

BATTLE OF BRITAIN





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assigning a speed and direction to each. Texas say they will shortly have an enhanced version (with the original name: TI LOGO II) which will incorporate sound facilities.

Then comes Tandy's version of LOGO which is currently only available on disk for £50, though we understand that a £30 ROM cartridge version will shortly appear for the Tandy TRS-80 Colour computer.

Moving downmarket, you can buy a fairly simplistic implementation of LOGO for the BBC Model B, for just £10 + VAT from *Computer Concepts, 16 Wayside, Chipperfield, Herts WD4 9JJ (Tel: 09277 69727).* It works on cassette, and though the authors don't claim it will compete with the products above, they do claim to have sold many hundreds of copies to interested schools.

Also at the bottom end comes *OK LOGO* which Jessop Electronics will supply with their Turtle, to run on the BBC B, Apple II and Research Machines 380Z/480Z – which seem to be the micros most favoured by educationalists.

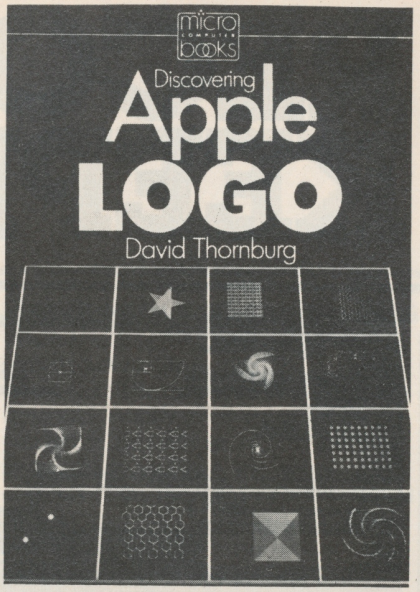
The 'OK' label comes from 'One-Key' – you can enter the primitive commands with a single key (F for Forward, etc). However OK LOGO has no screen Turtles, no facility to edit procedures, and no variables, let alone the powerful 'lists' though you can have sub-procedures and even recursion. These last three programs would perhaps be more aptly named TURTLE GRAPHICS than LOGO.

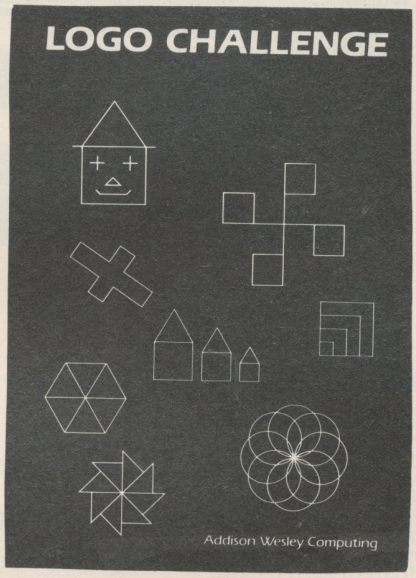
Next comes *LOGO CHALLENGE*, a combination of cassette-based programs for the BBC B, Spectrum and RML 380Z/480Z , plus well-produced teacher's and pupil's guides, from *Addison-Wesley Publishers (Tel: 01 631 1636).*

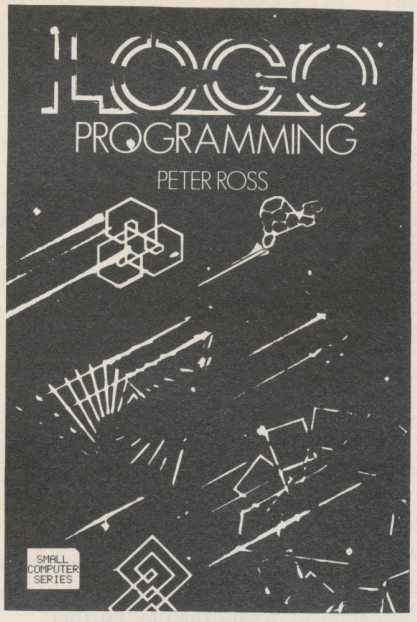
From here on, we move into the realm of 'nearly ready' versions of LOGO and the confusion multiplies.

Perhaps one of the most significant in this category is *DR LOGO* (That's Dee aaR, not Doctor) from the authors of the universal operating system CP/M – *Digital Research (Tel: 0635 35304).* To be released later this year on the IBM PC (and thence presumably on other 16-bit computers such as the DEC and Sirius), DR LOGO is probably the most complete implementation yet – far exceeding even Apple LOGO. This seems to be an unlikely departure for a company chiefly concerned with operating systems and utility programs – until you discover that the LOGO philosophy has become a major personal interest of D.R's founder and president – Gary Kildall.

Atari have a cartridge-based version being developed by LOGO Computer Systems Inc. which is already at the 'brochure available' stage! *Commodore* have shown me a prototype package for their '64 personal computer – one of the few machines that won't need expansion to memory to run. Both products should incorporate the 'Sprite' graphics features which TI LOGO pioneered.







A large range of books on LOGO programming for different machines are now available.

Rumour has it that both *Acorn* and *Research Machines* are close to launching 'really stunning' versions of LOGO, which may or may not be different from *Arrow* and *Dart* which are known to be LOGOs under development for the RML380Z and BBC computers respectively.

In short, when I started researching this feature, I knew of just a couple of LOGO products. It now seems, however, that manufacturers are falling over themselves competing to be first, and that a LOGO implementation could shortly be as important a marketing tool as Microsoft BASIC once was.

Books

LOGO, then, is just about to really happen – so I can't leave you without some information on where to find out more if you're interested. To begin with there is no shortage of books: *Mindstorms* by Seymour Papert, (The Harvester Press Ltd. and now available in paperback) should be compulsory reading for everyone, in my opinion!

Harold Abelson, too, has been involved in the LOGO project from the start and has written several tomes on the subect including: *LOGO for the Apple II,* (BYTE/McGraw-Hill), and *Turtle Geometry,* (MIT Press) which provide handbooks not only for particular versions of LOGO, but considerable guidance and course notes for teachers, too. Each of these give a list of further references as long as your arm.

Addison-Wesley, too, seem quite committed to LOGO, not only with their *LOGO Challenge* teacher and course, but with books on *LOGO Programming* and *Discovering Apple LOGO* already announced in their catalogue. Alternatively, if it's just Turtle Geometry that fasincates you, they also produce *Picture This!* which relates to the Atari PILOT language. Prentice-Hall who are rapidly increasing their range of computer titles publish *Learning LOGO on the Apple II.*

Reports

If you represent a school, then get in touch with Richard Noss at the Chiltern Microelectronics in Education Project (07072 66121), who have published a *LOGO Project Interim Report* (£2.50) based on their experiences in schools. *LOGO Report – A term with a floor turtle* by Beryl Maxwell and from the same source, also makes fascinating reading.

And for the really dedicated, there is a LOGO summer school for teachers, advisers and inspectors (not children) run by the Dept. of Artifical Intelligence at Edinburgh University itself. The dates are 18th-22nd July and 8th-12th August at £32 for the five days or £86 residential. More information from Mr. K.R.Johnson, 031 667 1011, ext. 2556. Phew!

RECORD KEEPER

Is the information that you need never at hand? Have you long since been promising to set up a database... "soon" ? – Or perhaps you've failed to discover the program to suit your requirements. This month *Bob Chappell*'s specially commissioned listing offers you a simple database program with the facility to scan all or just a part of each record.

All micro users have, at some time or another, a real need for a comprehensive information storage and retrieval program, one of the things that micros are so good at.

One small program of this type that I came across about two years ago had one very interesting feature. As well as the usual facility to look at each full record in turn, it also allowed you to scan just a part of each record.

This facility can be likened to that used in telephone directories, dictionaries, encyclopaedias, etc. where only a key piece of information is displayed at the top of each page. I have adopted and expanded this concept in the following program, and included what I hope are a number of other useful search and scan mechanisms.

The program has six main options; you can search for records, examine the file, sort the file, read in a file from disk, save a file to disk and create a new file.

Creating a new file

You will be asked to specify the number of items each record is to contain; there is a maximum of 10 items per record but no limit on the length of each item. The computer will also ask you to give a title to each of the items. Havng done this, you can start entering your data. The progam will only allow you to enter up to 50 records (as a security measure) before forcing you to save the file. Further records can be entered by reading the file in again and using the 'Add a record' option (see below). The program will display the amount of free memory left after each new record is added; this is necessary because it operates by holding all records in memory. The disadvantage of this method is that it places a restriction on the number of records per file, but, because all the records are held in memory, retrieval is very fast.

Search for records

Each record is given a record number, depending on its position with the file.Each record is given a record number, depending on its position within the file. You may either search by record number (which is useful for positioning in readiness for searching onwards from this point) or you may search using a particular item within the record. If you choose the latter, you must specify which item your search will be based on. You may then search in any of the following ways:

a) By matching against the complete contents of the item.
b) By matching only against the leftmost (leading) characters of the item.
c) By matching against a consecutive group of characters appearing anywhere within the item.

If a) or b) is chosen, you may also specify whether you want records which are equal, not equal, less than or greater than the value of the search criteria.

A list of all records meeting the desired criteria will be displayed on the screen and you can then examine each record, in full, by scanning forwards or backwards.

QUALITY LISTING

Examining the file

There are nine features under this option. The display will initially show one item from the current record at the top of the screen. You can then scan each item of that record, either forwards or backwards. Alternatively, you can keep the display positioned on a particular item and scan backwards and forwards through the file at will (the 'dictionary' concept), or you may display a complete record and continue by scanning, again in both directions, through all records in the file. If you want an automatic flip (fast or slow) through the file, there is also a facility there for you to do just that.

In addition, you may alter the contents or title of individual items or add new records to the file.

Sorting the file

This enables you to work on any two items. All records will subsequently be displayed in this chosen order.

Reading in and saving files

When selecting the 'Read' option, if you already have a file in memory, a warning message will be displayed to prevent you from accidentally overwriting it (in case you haven't already saved it to disk). If instructed to continue, the complete contents of the file are read in and stored in memory. Files are also 'Saved' to disk but the program can easily be converted to handle tape files.

On leaving the program, you will be asked to say whether or not you want a copy of the file currently in memory.

Although the program was written for a Commodore 64, you should have little difficulty converting it for other micros. With all the features embodied in it, the program should be able to cope with a great deal of your information storage and retrival requirements. If you have a Commodore 64 or PET and can't really face typing the listing in, copies of the program (£10 on disk, £7 on cassette) can be obtained from me at Newland Toft, South Green, Mattishall, Norfolk NR20 3JY.

Each month, *MicroComputer Printout* commissions Bob Chappell to write one quality program listing. This month *Record Keeper* was written for a Commodore 64, but designed in such a way that conversion for other micros should only take a matter of minutes. Next month's listing will be a *Simple Stock Control.*

In recent months the following programs have been published: *Tree Tracker, The Loan Gauger, Mileage Economy, Choice Optimizer, Speed Reading, Critical Path Analysis, Chess Recorder and Meeting Scheduler.* Back issues are available from the editorial address at a cost of £1.25 inc. p&p.

PROGRAM OUTLINE

15	POKE commands are for screen & border colour on Commodore 64
20-60	Sorting routine using a pointer array to store
65-175	Search by item
180-230	Record search menu
235-385	Examine file
390-455	Display record
460-595	Item search menu
600-630	Miscellaneous subroutines
635-755	Save to and read from disk. POKE commands are for users of Commodore 64 with VIC 1540 disk drive
760-795	Sort menu
800-810	Initialise
815-860	Main menu
865-890	Amend data
895-910	Amend title of item
915-990	Skip through file
995-1050	Create a new file
1055-1130	Add a record
1135-1165	End of run

MAJOR VARIABLES

RM	Maximum records allowed this run
TR	Total number of records
TF	Total number of items
R$(TR,TF)	Record and item array. R$(0,n) holds titles of each item
W(RM)	Array used as work area
SR(RM)	Array holding sorted record pointers
FY	Flag to indicate file in residence in memory
FL & FP	Pointers to current item
R	Pointer to current record
DE	Delay counter
NN$	File name
CHR$(13)	Use only when writing to Commodore disks

Reverse heart is Clear Screen
Reverse S is move cursor to top left of screen
Reverse Q is cursor down
Reverse R is reverse video on
Reverse space with low horizontal line is reverse video off.
Reverse space with central vertical line is cursor left
The symbol in line 1115 is cursor up.

QUALITY LISTING

```
5 REM***RECORD KEEPER***BY CHARLES***  V1.0
10 REM *** COMMODORE 64 ***
15 POKE53280,6:POKE53281,6:GOTO820
20 REM*** SORT ***
25 Q=INT(Q/2):IFQ=0THENR=1:GOTO820
30 J=1:K=TR-Q
35 I=J
40 L=I+Q:IFR$(SR(I),FL)<R$(SR(L),FL)GOTO55
45 IFR$(SR(I),FL)=R$(SR(L),FL)ANDR$(SR(I),W)<R$(SR(L),W)GOTO55
50 S=SR(I):SR(I)=SR(L):SR(L)=S:I=I-Q:IFI>=1THEN40
55 J=J+1:IFJ<=KGOTO35
60 GOTO25
65 REM*** ITEM SEARCH ***
70 FORZ=1TOTR:S=SR(Z):IFMS=0GOTO140
75 IFMS=2GOTO115
80 REM*** LEADING STRING ***
85 A$=LEFT$(R$(S,FL),L):IFC$="L"ANDA$<DI$GOTO165
90 IFC$="E"ANDA$=DI$GOTO165
95 IFC$="N"ANDA$<>DI$GOTO165
100 IFC$="G"ANDA$>DI$GOTO165
105 GOTO170
110 REM*** SLIDING STRING ***
115 QQ=0:A$=R$(S,FL):FORQ=1TOLEN(A$)-L+1
120 IFMID$(A$,Q,L)=DI$THENQ=99:QQ=1
125 NEXTQ:IFQQ=1GOTO165
130 GOTO170
135 REM*** WHOLE ITEM ***
140 A$=R$(S,FL):IFC$="L"ANDA$<DI$GOTO165
145 IFC$="E"ANDA$=DI$GOTO165
150 IFC$="N"ANDA$<>DI$GOTO165
155 IFC$="G"ANDA$>DI$GOTO165
160 GOTO170
165 PRINTZ;TAB(5)R$(S,0):EX=EX+1:W(EX)=Z
170 NEXT:IFEX=0THENPRINT"■■■NONE FOUND":GOSUB610:GOTO820
175 GOTO575
180 REM*** RECORD SEARCH ***
185 IFFV=1GOTO195
190 PRINT"■■NO FILE IN MEMORY":GOSUB610:GOTO820
195 PRINT"■"TAB(8)"■ RECORD SEARCH ":GOSUB615
200 PRINT"■ ENTER  I  TO SEARCH BY ■ ITEM "
205 PRINT"■ ENTER  N  TO SEARCH BY ■ RECORD NUMBER ■":GOSUB615
210 GOSUB625:IFC$="I"THEN465
215 IFC$<>"N"THEN210
220 PRINT"■ THERE ARE"TR"RECORDS.
225 INPUT"■RECORD NO.";K$:R=VAL(K$):IFR<1ORR>TRGOTO225
230 GOTO390
235 REM*** EXAMINE FILE ***
240 PRINT"■":IFFV=0GOTO190
245 FL=0:S=SR(R):PRINT"■■ ";N$;" "TAB(19)," RECORD NO";R;"■■ ":GOSUB615
250 F1=FL+FP:PRINT"■ "R$(0,F1)" "
255 PRINT"■"LEFT$(R$(S,F1),39)
260 GOSUB615:PRINT"ENTER :-" PRINT
265 PRINTTAB(9)"<  SEE PREVIOUS ITEM
270 PRINTTAB(9)">  SEE NEXT ITEM
275 PRINTTAB(9)"N  SEE NEXT RECORD
280 PRINTTAB(9)"P  SEE PREVIOUS RECORD
285 PRINTTAB(9)"R  SEE WHOLE RECORD
290 PRINTTAB(9)"F  SEE WHOLE FILE
295 PRINTTAB(9)"C  CHANGE ITEM DATA
300 PRINTTAB(9)"H  CHANGE ITEM HEADING
305 PRINTTAB(9)"A  ADD A RECORD
310 PRINT"■   ■ SPACE BAR FOR OPTIONS "
315 GOSUB625:IFC$=">"THENFP=FP+1
320 IFC$="<"THENFP=FP-1
325 IFC$="N"THENR=R+1:IFR>TRTHENR=TR:GOTO315
330 IFC$="P"THENR=R-1:IFR<1THENR=1:GOTO315
335 IFC$="C"THEN570
340 IFC$=" "THEN820
345 IFC$="F"GOTO920
350 IFC$="R"GOTO390
355 IFC$="H"GOTO900
360 IFC$="A"THENF=1:GOTO1060
365 IFFP<0THENFP=0:GOTO315
370 IFFL+FP>TFTHENFP=TF:GOTO315
375 PRINT"■■■";:IFC$="N"ORC$="P"THENPRINT:GOTO385
380 PRINT"                                                                    "
385 PRINT:PRINT"                                                              ":GOTO245
390 PRINT"■■ "N$;" ";TAB(19)" RECORD NUMBER";R;"■■ ":GOSUB615:FORFL=0TOTF
395 PRINT"■ "R$(0,FL)" ":PRINTR$(SR(R),FL)
400 GOSUB615:NEXT:PRINT"■■ PRESS :-  SPACE BAR TO LEAVE          "
405 PRINT"■ N FOR NEXT OR P FOR PREVIOUS RECORD "
410 GOSUB625:IFEX>0GOTO430
415 IFC$="N"THENR=R+1:IFR>TRTHENR=TR:GOTO410
420 IFC$="P"THENR=R-1:IFR<1THENR=1:GOTO410
425 GOTO445
430 IFC$="N"THENSX=SX+1:IFSX>EXTHENSX=EX:R=W(SX):GOTO410
435 IFC$="P"THENSX=SX-1:IFSX<1THENSX=1:R=W(SX):GOTO410
440 R=W(SX)
445 IFC$="P"ORC$="N"GOTO390
450 IFC$=" "THENEX=0:GOTO240
455 GOTO410
460 REM*** ITEM SEARCH MENU ***
465 PRINT"■"TAB(9)"■ ITEM SEARCH ■":GOSUB470:GOTO475
470 GOSUB615:FORZ=0TOTF:PRINTZ+1;TAB(8),R$(0,Z):NEXT:GOSUB615:RETURN
475 INPUT"NUMBER OF ■ ITEM ■ TO BE SEARCHED";K$
480 FL=VAL(K$)-1:IFFL>TFORFL<0THENPRINT"■■NO SUCH ITEM":GOSUB610:GOTO820
485 PRINT"■"TAB(9)"■ "R$(0,FL)" SEARCH ":GOSUB615
490 PRINT"* THEN CHARACTERS FOR LEADING SEARCH
495 PRINT"+ THEN CHARACTERS FOR SLIDING SEARCH
500 PRINT"NORMAL CHARACTERS ONLY FOR ITEM MATCH
505 INPUT"■VALUE ";DI$
510 DF$=DI$:GOSUB615
515 MS=0:IFLEFT$(DI$,1)="*"THENMS=1:GOTO530
520 IFLEFT$(DI$,1)="+"THENMS=2:GOTO530
525 GOTO535
530 DI$=MID$(DI$,2):L=LEN(DI$):IFMS=2GOTO570
535 PRINT"DO YOU WANT ■ "R$(0,FL)" ■ :-"
540 PRINT"■(E) EQUAL TO"TAB(18)DI$
545 PRINT"■(N) NOT EQUAL TO"TAB(18)DI$
550 PRINT"■(L) LESS THAN"TAB(18)DI$
555 PRINT"■(G) GREATER THAN"TAB(18)DI$"■"
560 GOSUB625:IFC$="E"ORC$="N"ORC$="G"ORC$="L"GOTO570
565 GOTO560
570 PRINT"■■ "R$(0,FL)" ■ "DF$:GOSUB615:EX=0:GOTO70
575 PRINT"■■ PRESS SPACE BAR TO RETURN          "
580 PRINT"■ PRESS E TO EXAMINE THESE RECORDS "
590 IFC$=" "THENEX=0:GOTO820
595 GOTO585
600 REM*** SUBROUTINES ***
605 INPUTK$:RETURN
610 FORQ=1TO999:NEXT:RETURN
615 PRINT"                                                                    ":RETURN
620 PRINT"■■■■ ANSWER Y (YES) OR N (NO) ":RETURN
625 GETC$:IFC$=""GOTO625
630 RETURN
635 REM*** SAVE FILE ***
640 IFFV=0GOTO190
645 PRINT"■■■CURRENT FILE NAME IS ■ "N$" "
650 INPUT"■■■NEW NAME ";N$
655 NN$="0:"+N$+",S,W"
660 POKE53265,11:OPEN5,8,5,NN$:PRINT#5,TR;CHR$(13);
665 PRINT#5,TF;CHR$(13);:FORR=1TOTR:FORFL=0TOTF
670 PRINT#5,R$(SR(R),FL);CHR$(13);:NEXT:NEXT
675 FORFL=0TOTF:PRINT#5,R$(0,FL);CHR$(13);
680 NEXT:CLOSE5:POKE53265,27:IFSC=1GOTO1165
685 GOTO820
690 REM*** READ IN FILE ***
695 IFFV=0GOTO730
700 GOSUB705:GOTO715
705 PRINT"■■FILE ALREADY IN MEMORY"
710 PRINT"■■ARE YOU SURE YOU WANT TO DO THIS?":GOSUB620:RETURN
715 GOSUB625:IFC$="N"THEN820
720 IFC$="N"THEN820
725 IFC$<>"Y"THEN715
730 CLR:GOSUB800:INPUT"■■■■■■NAME OF FILE ";N$
735 NN$="0:"+N$+",S,R":POKE53265,11:OPEN5,8,5,NN$
740 INPUT#5,TR:INPUT#5,TF:RM=TR+50:IFRM>450THENRM=450
745 DIMR$(RM,TF),W(RM),SR(RM)
750 FORR=1TOTR:FORFL=0TOTF:INPUT#5,R$(R,FL):NEXTFL:FORR=1TOTR:SR(R)=R:NEXT
755 FORFL=0TOTF:INPUT#5,R$(0,FL):NEXT:CLOSE5:POKE53265,27:R=1:FV=1:GOTO820
760 REM*** SELECT SORT ***
765 IFFV=0GOTO190
770 PRINT"■"TAB(14)"■ SORT ":GOSUB470
775 INPUT"■NUMBER OF ■ MAJOR ITEM ■ FOR SORT";K$
780 FL=VAL(K$)-1:IFFL>TF OR FL<0GOTO775
785 INPUT"■NUMBER OF ■ MINOR ITEM ■ FOR SORT";K$
790 W=VAL(K$)-1:IFW>TF ORW<0GOTO785
795 Q=TR:PRINT"■■■ SORTING FOR 2-3 MINS.":GOTO25
800 TF=0:TR=0:J=0:Q=0:Z=0:K=0:I=0:F$="":C$="":N$="":NN$="":R=0:FL=0:F=0:W=0
805 K$="":FP=0:F1=0:DI$="":DF$="":SX=0:EX=0:MS=0:SC=0:S=0
810 FV=0:L=0:QQ=0:RETURN
815 REM*** MAIN MENU ***
820 PRINT"■"TAB(10)"■ RECORD KEEPER ■":GOSUB615
825 PRINT"1. SEARCH FOR RECORDS":GOSUB615
830 PRINT"2. EXAMINE THE FILE":GOSUB615:PRINT"3. SORT THE FILE":GOSUB615
835 PRINT"4. READ IN A FILE":GOSUB615:PRINT"5. SAVE THE FILE":GOSUB615
840 PRINT"6. CREATE A NEW FILE":GOSUB615
845 PRINT"7. EXIT PROGRAM":GOSUB615
850 PRINT"■■■WHICH NUMBER?"
855 GETC$:A=VAL(C$):IFA<1ORA>7THEN855
860 ONAGOTO185,240,765,695,640,1000,1140
865 REM*** ALTER DATA ***
870 PRINT"■"TAB(10)"■ CHANGE DATA ■"
875 GOSUB615:PRINT"■CURRENT ■ "R$(0,FL+FP);" ■"
880 PRINTR$(SR(R),FL+FP)"■":GOSUB615
885 PRINT"■NEW DATA FOR "PRINT"■■ "R$(0,FL+FP),:INPUT" ■";K$
890 R$(SR(R),FL+FP)=K$:GOTO240
895 PEM*** ALTER HEADING ***
900 PRINT"■"TAB(10)"■ CHANGE HEADING ■":GOSUB615
905 PRINT"■ITEM HEADING TO REPLACE":PRINT"■■ "R$(0,FL+FP),
910 INPUT" ■";K$:R$(0,FL+FP)=LEFT$(K$,10):GOTO240
915 REM*** SEE FILE ***
920 DE=2000:PRINT"■":GOSUB615:PRINT"■PRESS E     TO EXIT
925 PPINT"■PRESS SPACE TO STOP/START DISPLAY
930 PRINT"■PRESS S     TO SLOW DOWN DISPLAY
935 PRINT"■PRESS Q     TO QUICKEN DISPLAY":GOSUB615
940 GETC$:IFC$<>" "GOTO940
945 FORR=1TOTR:PRINT"■■ ";N$;" "TAB(24);" RECORD NO";R;"■■ ":GOSUB615
950 FORFL=0TOTF:PRINT"■ "R$(0,FL)" ":PRINTR$(SR(R),FL):GOSUB615:NEXT
955 FORZ=1TODE:GETC$:IFC$="E"GOTO240
960 IFC$=" "THENPRINT"■■ PRESS SPACE TO RESTART ":GOTO965
965 IFC$="Q"THENDE=DE-1000:Z=5000
970 IFDE<1THENDE=50
975 IFC$="S"THENDE=DE+100:Z=5000
980 NEXTZ,R:R=TR:GOTO240
985 GETC$:IFC$<>" "GOTO985
990 Z=DE:GOTO980
995 REM*** CREATE FILE ***
1000 PRINT"■":IFFV=0GOTO1025
1005 GOSUB705
1010 GOSUB625:IFC$="N"THEN820
1015 IFC$<>"Y"THEN1010
1020 CLR:GOSUB800:PRINT"■"TAB(9)"■ CREATE NEW FILE ■":GOSUB615
1025 INPUT"FILE NAME ";N$:GOSUB615
1030 INPUT"ITEMS PER RECORD ";K$:TF=VAL(K$)-1
1035 IFTF<0ORTF>9THENPRINT"■ MAXIMUM IS 10 ":GOTO1030
1040 RM=50:FV=1:DIMR$(RM,TF),W(RM),SR(RM):FL=TF:PRINT"■FILE IS ■ ";N$
1045 FORJ=0TOFL:GOSUB615:PRINT"■ TITLE ■ OF ITEM"J+1;:INPUT"■■ ";I$
1050 R$(0,J)=LEFT$(K$,10):NEXT
1055 REM*** ADD NEW RECORD ***
1060 IFR=1THENTR=TR+1:R=TR:GOTO1070
1065 R=1:TR=1:SR(1)=1:W(1)=1
1070 IFR<=RMGOTO1090
1075 PRINT"■■MAXIMUM OF 50 NEW RECORDS REACHED.
1080 PRINT"■PLEASE SAVE THEN RELOAD THE FILE.
1085 FORJ=1TO3000:NEXT:TR=TR-1:R=TR:GOTO820
1090 PRINT"■"INT(FRE(0))"BYTES OF MEMORY LEFT.
1095 PRINT"■MAX.OF"RM-R+1"MORE NEW RECORDS THIS RUN.
1100 PRINT"■ENTER # IN ■ "R$(0,0)" ■ WHEN FINISHED":GOSUB615
1105 PRINTTAB(9)"■ RECORD NUMBER";R"■■ ":GOSUB615
1110 FORFL=0TOTF:PRINT"■ "R$(0,FL)" ":PRINT"■",
1115 IFR>1THENPRINT"  ";R$(R-1,FL):PRINT"";
1120 INPUTK$:R$(R,FL)=K$:GOSUB615:IFK$="*"THENFL=TF
1125 NEXT:IFK$="*"THENTR=TR-1:R=TR:GOTO820
1130 SR(R)=R:R=R+1:TR=TR+1:GOTO1070
1135 REM*** EXIT PROGRAM ***
1140 IFTR=0GOTO1165
1145 PRINT"■■DO YOU WANT A SECURITY FILE COPY?":GOSUB620
1150 GOSUB625:IFC$="N"THEN1165
1155 IFC$="Y"THENSC=1:GOTO640
1160 GOTO1150
1165 PRINT"■■END":GOSUB610:END
```

"practically speaking...

Machines:
Commodore 64 · VIC 16K · CBM 8000/4000/3000 ·
BBC · Spectrum 48K · Dragon · Oric

Programs:

DFM Database
Fully User-definable
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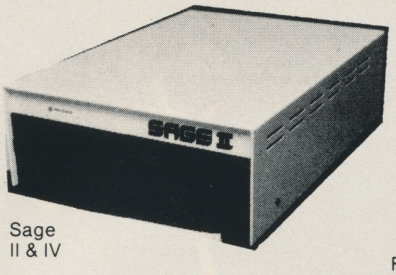

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The Hanover Fair is traditionally the most important date in the European Calendar for new microcomputer product announcements. *Julian Allason* reports on the big manufacturers official announcements, as well as a few 'unofficial' ones!

THE HANOVER FAIR

A small theatre weapon would have done it. The expenditure of one five kiloton nuke airburst 400 metres above the Hanover Trade Fair, and the Russkies might have taken out Europe's entire micro electronics industry all in one go.

There really isn't anything else quite like Hanover. The Fair site is the size of an English market town with a daily population double that of Wigan's. Needless to say it is all organised with thorough-going German efficiency.

Anyone who is anyone in the British microcomputer industry, and quite a few who aren't, was there. Though many of them would have been hard put to tell you why. The truth is that the Fair is now too big. Even though what you have come to see will undoubtedly be there, your chances of finding it must be pretty near zero. Especially after lunch. My request for a computer analysis of exhibitors in the microcomputer category, was duly met with 17 feet of printout.

It helped then to know what you were looking for. I was after portable computers.

I was in for a disappointment. Olivetti, for reasons best known to their research and development chief, Signor Piol, had chosen to leak the suggestion that Hanover would witness the launch of a 'revolutionary' new product, dubbed the midgi-computer. In the event Olivetti's and well-tailored young men were as much in the dark as the company's UK computer chief, Les Marshall. In the circumstances, the best I can do is to relay the substance, if that is the right word, of Dr. Pilo's hints.

What Olivetti seem to have developed is a superior data capture device, a microcomputer, almost certainly battery powered, almost certainly sporting CMOS circuitry and a liquid crystal display, which can be plugged into 'any' electronic typewriter or word processor. 'Any' in this context should be given its conventional industry meaning of 'one or two prototypes of our own devising'.

The gizmo-oriented manager will, if he can live with the humiliation, type his own notes, memos, and possibly even correspondence, as he makes his stately progress from restaurant to massage parlour. On the odd occasion when he strays near the office he can plug into a typewriter for a printout.

High tech chunder

Next, to the Commodore stand, a substantial double-decker with a bar and conference room whence one of my colleagues, who had better be nameless (you owe me one for that, Henry) once became emotional over the side, onto a group of unfortunate burghers on the show floor beneath.

Here there is a matter of considerable exitement to consider. To whit, the *Colour 64*,. a handsome portable incorporating either one or two 3-1/2 inch disk drives and a colour, yes I did say colour, screen. A word with the Man elicits the information that the single drive version will retail for $995 (about £650!)

The quoted price and June delivery date may of course be Commodorespeak, a technique whereby with the best intentions in the world of course, the company pre-announces products to put the frighteners on the competition. It certainly had that effect at one or two other stands, where competitors were indulging in uproarious laughter. I fancied it sounded a trifle hollow, however, because *when* the Commodore does deliver (author's emphasis on *when*), it usually *is* at a price that makes the competition's eyes water.

More sober (although sobriety was at a premium amongst Fair-goers) counsels suggest a UK selling price of £995 for the twin disk version. Pas mal!

One last point about the Commodore portable. The prototype I saw and used was, down to its slot for plug-in ROM cartridges, a *Commodore 64* rendered portable. A nice genuflection towards the alter of compatibility with previous products.

Muscle bound

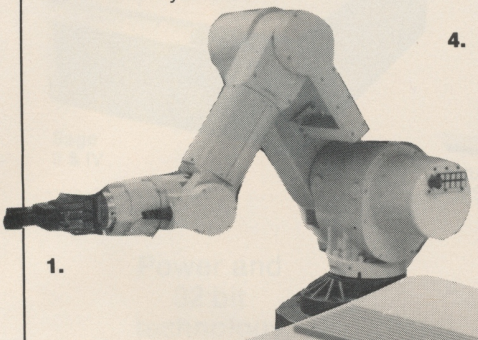
Make what you will of Osborne's decision to hide their new *Executive* briefcaseable computer away on the back of their stand. Indeed, this long awaited wonder box so closely resembles its famous original that one could be forgiven for passing it by.

As predicted on these pages, it includes half height disk drives, the extra space being made over to a larger screen. (Hurrah!). Otherwise the size and shape, but not the price, are as before.

As the name suggests, the Osborne portable is intended for executives. A selection of complimentary software reflects this too, Personal Pearl, as well as Wordstar and SuperCalc.

Personally I have to confess to a degree of disappointment. But that is probably because I know that the company's 7' tall ex-patriot English founder has been fiddling about with a much smaller portable using the new 3-1/2" micro floppy drives. More importantly it will be *IBM P.C* compatible. But it wasn't at the show, and the *Executive* is an improvement, albeit one that is likely to cost the best part of £2,000 when it surfaces here this autumn.

Anyone else craving compatibility with the IBM *Personal Computer* would have been satisfied, nay, sated by the plethora of Nipponese offerings, most of them of great ugliness and bulk. Whatever the aesthetic shortcomings, the offerings of Japan Inc. more than made up for the disappointment with superb high resolution graphics. Toshiba had a stand occupying the greater part of an acre on which appeared the first combined text and speech micro workstation. Hitachi were similarly busy showing personal computers running colour graphics, the like of which you wot not of.



1.

2.

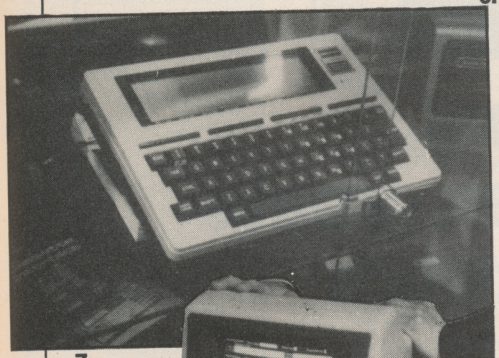
3.

4.

1. How are your teeth? Micro controlled robot drill. Also makes tea, kills trade unionists.
2. Half height disk in Commodore's portable colour '64; but you could have two.
3. Cinerama from SKS. The things people will do for publicity.
4. Now you see it, now you don't: sleight of hand from Victor.

5.

6.



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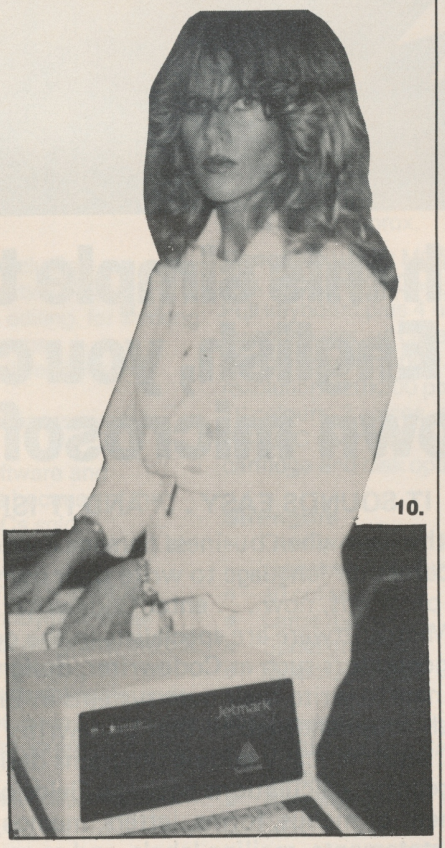
8.



10.

9.

On the topic of Toshiba, your reporter encountered a coterie of multinational microcomputer designers wrapt in admiration for that company's new 64K CMOS RAM chip. The point, dear reader, is that such a device gives the battery-powered bandwagon a sharp (sic) nudge. Eight of those chips occupy a space not much larger than a packet of 20 Gitanes, and hardly need more power to run...

Whizz bang

An interesting illustration of the industry's pecking order was offered by Tandy. A few, a very few of the great and the good, were treated to a sneak preview of their forthcoming *Model 100* Micro Executive workstation. Without necessarily aspiring to such exalted company, let me tell you that the thing is a whiz.

A bit smaller than your telephone book with a 40-character wide 8-line display and up to 24K of CMOS RAM memory, it had dealers dancing with delight. The point of greatest personal appeal was that display, probably the minimum with which I could conduct the portable word processing operation I so earnestly desire.

The workstation should see the light of day here this summer priced around £550, assuming sterling doesn't indulge in a further fit of silly beggars against the dollar.

Just as your intrepid reporter was lining the controversial new *Atari 1200* up in the viewfinder of his Olympus XA, a large unidentified flying object interposed itself. Said object revealed itself to be the large and hirsute hand of a stormtrooper style security man. Acting, it transpired, under instructions to prevent photographs of Atari's latest home computer by 'Japan men'. Once it had been established that photography by Britishers, albeit equipped with Japan man-type apparatus, was not verboten, I had an opportunity to examine the Warner Brothers' latest toy.

As befits a company wholly owned by one of Hollywood's most illustrious brotherhoods, the *Atari 1200* is sleek to the point of flashiness. Its ample RAM, boosted to 64K from the 48K boasted by the current top of the line *800* model, improved colour and HELP key ought to have earned it a place amongst the most eagerly anticipated forthcoming models. But no, the self-elected band of arbiters of the industry's collective taste have given it an almost universal thumbs down.

"Dull", "Boring", "Disappointing" are some of the epithets hurled into print by the sages of Silicon Valley. Which perhaps goes to show that there is a price to be paid for success. Like Osborne, Atari had been expected to produce something as revolutionary as their original product had been in its day.

Revolutionary the *1200* certainly is not. Any revolving will be done by the company's impending *600* and *800XL* models, the very existence of which has hitherto been a close guarded secret (you see it pays to study this column closely). The *1200* is simply a 'premium machine' intended to provide a convenient product for the man who must have the mostest in home computer colour graphics.

Expect it towards the end of the year. Ditto the *600* and *800XL*.

Now, if you will excuse me, I must go and rejoin a couple of charming young Frauleins, whose acquaintance I made at the Fair. A small matter of in depth research, you understand.

5. **Much ado about nothing? Atari's sleek new 1200.**
6. **Lovely colour, awful design from Seiko.**
7. **Under lock and key: Tandy's amazing Model 100 portable executive workstation.**
8. **Hallo Sony: microdrives in HP's saucy Model 16.**
9. **Osborne's Executive: spot the difference from the Osborne 1.**
10. **Scrub-a-dub-dub: Eine naughty Fraulein.**

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MCP

IN BUSINESS
WITH VIC + THE '64

HOME TO BUSINESS

VIC-20

Cost: £130 approx.

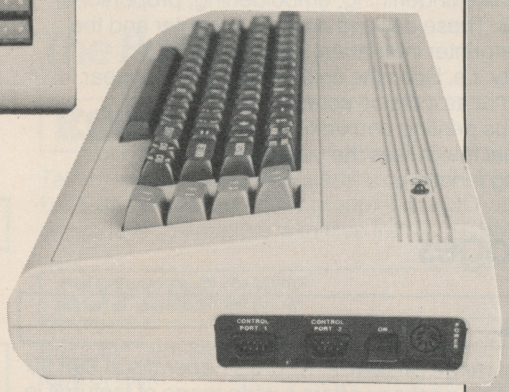
Specifications: 6502 CPU, 5K RAM (expandable), 20K ROM, BASIC.
Full keyboard plus four user-definable function keys, u/l case
22 col, 23 rows display,
graphics resolution 176x158 pixels
16 colours, 3 voices. Own cassette, cartridge and disk option.

Strengths

- Quality keyboard including programmable function keys
- Very good screen editing, for working on your own programs
- Flexible sound facilities for game effects
- Good range of interfaces available at the back
- Large range of software and hardware add-ons because of the vast number of VICs sold.

Weaknesses

- Unexpanded memory is limiting
- Screen width is annoyingly small when writing text or programs but o.k for graphics
- BASIC lacks any special commands for handling colour, sound and hi-res graphics, making programming hard work
- Requires special VIC cassette deck



'64

Cost: £300 approx.

Specifications: MOS 6510 CPU, 64K RAM, 20K ROM, BASIC.
Full keyboard plus 4 user-definable function keys, u/l case.
40 col, 25 row display. Graphics resolution 320x200 pixels.
16 colours, 3 voices, synthesizer.
RS232C user port. Own cassette, cartridge and disk option.

Strengths

- Quality keyboard including programmable function keys
- 40 col screen
- Large memory
- Sprite graphics
- Music synthesis

Weaknesses

- BASIC (unless *Simon's Basic* is added)
- Requires special VIC cassette deck

The gap between the business and the home micro narrowed with the launch of the Commodore 64 at the beginning of this year. Nonetheless, as we said in the series **Home to Business** (December '82 – March '83) the 64's business potential will only reach fruition if quality business software is produced for it. So, five months on, the acid test has arrived. Now you can judge for yourself from the following pages whether Commodore really can claim that the '64 is, to quote the ad, "changing business for the better".

While researching '64 Business Software it also became apparent that its predecessor, the VIC 20, had also amassed an entourage of business packages during its somewhat longer life, despite its limited memory. For the sake of truth and completeness a list of VIC 20 Business Packages (which don't run on the '64 and vice versa) therefore appears a few pages on, but as the chart indicates many of them will be inoperative without an add-on memory expansion pack (see *VIC RAM* in **Paragraphs** if you only have the standard 3½K).

I have divided '64 software into function categories, including a list of potential facilities of each type of function, intended to help you decide what you require and therefore, with the help of brochures and salesman (in that order), what to buy. But, if there's one message that I'd like this article to convey it's this: if you haven't already chosen your hardware, WAIT, decide what you want the software to do, select the best package for your requirements, and *then* buy the appropriate hardware because the VIC 20 and the Commodore 64 are by no means the only micros with both home and business facilities. (see: **Home to Business** December 1982 *Atari: A Test Case*)

Software is listed in price – descending order and all prices quoted include VAT.

GUIDE TO '64 BUSINESS SOFTWARE

Word Processing

Certainly the most prolific type of 64 software, a reflection of the general market trend.

Features to look for include:

- The number of pages that it will hold in memory at once.
- Compatibility with other packages e.g. spelling checkers, mailing lists.
- Print facilities like underlining, emboldening, proportional spacing. (N.B. These depend on a good printer and the right software/printer interfaces).
- Visual integrity. i.e. Does the final printed page appear in the same format as it did on screen.
- A simultaneous printing and editing facility.
- A package that maximises the use of the keyboard for various editing functions.

The Packages

KOBRA

At the top end of range pricewise, Kobra's *Paperclip* at £98.90 comes on disk. This package offers a wide range of features in addition to the normal word processing facilities and is compatible with 'Spell Pro' and 'Mail Pro'.

WEGO

In price descending order Professional Software's *WordPro 3 – Plus* distributed in the UK by Wego comes next. This is also on disk and makes claim to every feature considered important in commercial word processing at £92.00.

AUDIOGENIC

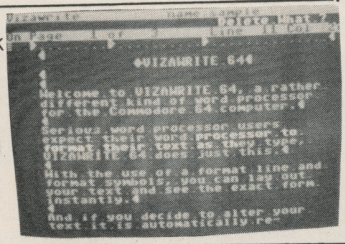
Wordcraft 64 on cartridge is available from Audiogenic at £89.95 and is the successor of 'Wordcraft 20' for the VIC. Apparently its release was delayed by the completion of its "sophisticated user's manual."!

DATAVIEW

The disk version of *Wordcraft 64* is available from Dataview, but the price is yet to be decided.

VIZA SOFTWARE

Vizawrite 64 is available on disk at £79.35. We understand that a cartridge version is also in preparation. *Viza Spell 64* will also be available soon and will of course be fully compatible with 'Vizawrite'.


Vizawrite
Name sample
Page 1 of 1 Line 11 Col 1
#VIZAWRITE.646
Welcome to VIZAWRITE 64, a rather different kind of word processor for the Commodore 64 computer.
Serious word processor users expect their word processor to format their text as they type. VIZAWRITE 64 does just this.
With the use of a format line and format symbols, you can lay out your text and see the exact form instantly.
And if you decide to alter your text it is automatically re-

COMMODORE

Easy Script designed by Precision Software is distributed by Commodore at £75.00; it is their only current '64 business package.

SPT ELECTRONICS

Down a stage further in terms of price is SPT's *Quick Brown Fox* at £60.00, which claims to be a "Wordstar – calibre word processing workstation". It comes on cassette.

GALASET

Last but one, *Rapidwriter* on disk distributed in the UK by Galaset, reduces the cost of word processing to £49.95.

SIMPLE SOFTWARE

To hit the cliché button, lastly but not least-ly, is the competitively priced *Simply Write for 64* from Simple Software. On disk the price is £46.00, on cassette £40.25. To quote Simple, "Please don't judge this program on its price" and to quote us... "Don't merely judge the more expensive one's by their price either".

Spelling Checkers

A useful addition to a word processing package, so check for compatibility first.

Other features to look for include:

1. The facility to learn new words.
2. The speed of operation.
3. Can it cope with English and/or American words.
4. Total vocabulary size.

The Packages

KOBRA

SpellPro on disk at £78.35 is compatible with the word processor 'Paperclip' and the database 'MailPro'. It can be expanded to include up to 80,000 words.

VIZA SOFTWARE

Viza Spell 64 at £67.85 will be compatible with 'Viza Write 64' when it is launched later this year.

Company Addresses

Anagram Systems
60A Queen Street
Horsham
West Sussex
RH13 5AD
Tel: 0403 50854

Audiogenic
P.O. Box 88
Reading
Tel: 0734 595647

Commodore
The Commodore
Information Centre
675 Ajax Avenue
Slough
Berks SL1 4BG
Tel: 0753 79292

GUIDE TO '64 BUSINESS SOFTWARE

Databases

More adequately described as electronic filing systems; if updated regularly they can save a lot of time and effort.

Features to look for include:

1. The maximum number of characters in a record.
2. A variety of search criteria.
3. Facilities to design and create reports.
4. The facility to sort data and extract an index.
5. Optional password protection.
6. Help facility.
7. Calculator facility.
8. Compatibility with other packages e.g. Word Processor to produce mailshots, Spelling Checker.

The Packages

PRECISION SOFTWARE

First in this range is *Superbase 64* from Precision Software. It offers a wide range of facilities and costs £100 on disk.

RABBIT SOFTWARE

Second in descending price order lie Rabbit with *Infomast*. Available on disk and retailing at £92.94.

KOBRA

Fully compatible with 'Paperclip' and 'SpellPro', Kobra's database *MailPro* is capable of holding 4,000 records on a standard 8050 diskette. A simple database principally intended for use with 'Paperclip', it costs £78.35 on disk.

SIMPLE SOFTWARE

Simply File is due for release as this magazine hits the newstand. It employs dual disk drives, costs £69.00, and has simple calc facilities. It was nice to see that their sales blurb outlined its limitations as well as its strengths.

KUMA COMPUTERS

A leap-away from its predecessors price-wise, *Solidstate Database* from Kuma is the fifth and final (known) database for the Commodore '64. The price is £24.50 and the makers claim that it's user friendly.

Calcs

Otherwise known as spreadsheets, financial planning packages or "what if...?" programs these packages are an invaluable business aid. But tread carefully, the 64 Calcs' range is an odd beast boasting widely varying prices, so reading between the sales blurb is particularly important.

Features to look for include:

1. The maximum spreadsheet size i.e. no. of columns x no. of rows.
2. Special functions e.g. for statistics.
3. Print facilities.
4. Graphics capability.
5. Maximum field size i.e. the largest number of characters you can hold in each cell on the matrix.
6. Consolidation i.e. can information held on two different parts of the file be consolidated, for example to form a profit and loss statement from income and expenditure files.

The Packages

KOBRA

Taking them in price descending order, Kobra's *Calc Result* at £125.35 comes top of this group. It is a '3D' spreadsheet on disk and is compatible with files from the CBM 8000 version.

SUPERSOFT

BusiCalc from Supersoft retails at just £44.85, and comes on tape or disk.

GALASET

The cheapest 64 Calc comes from Galaset at £15.95. They say that *Vicky Calc* is their "Simple answer to the 'big boys'".

Accounting

Unlike WP, Calc and Database, if you install a computer in your accounts deptartment you are replacing an existing system – which can be a recipe for disaster. However, if you are prepared to invest time in finding the right package and installing it, the benefits include tighter credit control and improved cash-flow.

The Packages

DATAVIEW

The *Electronic Cashbook* available from Dataview at £195.00 eliminates some of the tedious tasks involved in keeping a cash book.

MICRO SIMPLEX

For £150 Micro-Simplex produce the disk based *Simplex 64*. The sales blurb describes it as a "small business accounts and stock control" package. Its menu driven system offers the following selection: a Basic Cash and Bank System, VAT Reporting, Audit Trail, Outstanding Invoices and Unpaid Bills.

ANAGRAM SYSTEMS

Two packages for the 64 are now available from Anagram: a *Sales Ledger* with Invoicing and a *Purchase Ledger* with Nominal Accounts. Both are on disk and retail at £113.85.

The Computer Room
87 High Street
Tonbridge
Kent TN9 1RX
Tel: 0732 355962

Dataview
Radix House
East Street
Colchester
Essex CO1 2XB
Tel: 0206 869414

DDM Ltd
22 Warley Hill
Brentwood
Essex CM14 5HA
Tel: 0277 229379

Dynatech Microsoftware
Summerfield House
Summerfield Road
Vale
Guernsey
Channel Islands
Tel: 0481 45934

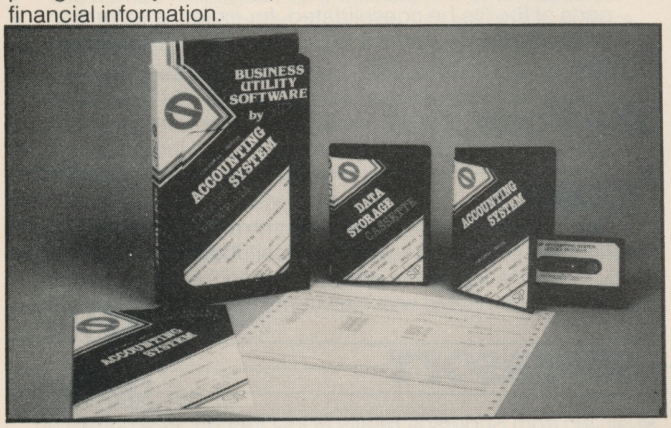
Galaset Ltd
30 Bayford Road
Littlehampton
W. Sussex
Tel: 01 549 8229

Kobra Micro Marketing
P.O. Box 28
Henley-on-Thames
Oxon RG9 1PF
Tel: 04912 2512

GUIDE TO '64 BUSINESS SOFTWARE

SHORE I.P.

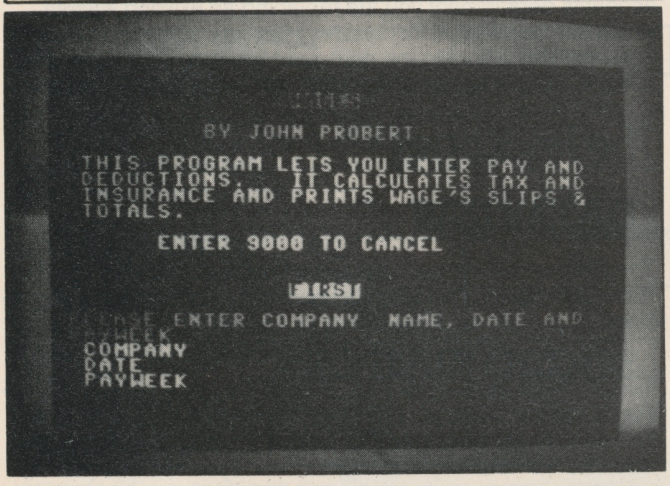
At the price conscious end of the 'accounting' market lies the *SIP Accounting System* at £28.75 on cassette. Originally designed by a small company for their own use, this program is intended for use by other small businesses who don't want to plunge full way into an expensive system, but need instant financial information.



KUMA COMPUTERS

Solidstate Non VAT Accounts is designed for small businesses and clubs needing to keep financial records for personal, tax and audit reasons without being necessary to warrant registration. This software comes on cassette at £24.50.

STUDIO SOFTWARE


BY JOHN PROBERT
THIS PROGRAM LETS YOU ENTER PAY AND DEDUCTIONS. IT CALCULATES TAX AND INSURANCE AMD PRINTS WAGE'S SLIPS & TOTALS.
ENTER 9000 TO CANCEL
FIRST
COMPANY
DATE
PAYWEEK

The BUSCOM range from John Probert consists of four packages covering *Business Accounts, Retail Accounts*, a 'Wages System' and 'Stock Control'. They are all available on disk at £21.95 and tape at £19.95. Studio will amend programs to suit individual needs, and guarantee a back-up service.

Stock Control

Hand in hand with Accounting packages goes Stock Control. Self-explanatory, so without more ado:

The Packages

DDM

At £138.00 DDM produce *Stock Control* in their Factory Manager 64 range. As an optional extra *Assemblies Option* is also available at £51.75; it relates parts in stock to the finished item being manufactured.

STUDIO SOFTWARE

In their BUSCOM range, *Buscom-4* is the Stock Control System. Like 'Business Accounts', 'Retail Accounts' and the 'Wages System' this package costs £19.95 on cassette and £21.95 on disk.

GALASET

Business Inventory by Galaset quote "May be 'heaven sent' to your business". Heaven sent or not it still costs £15.95 on cassette.

Wages Systems

Again self explanatory, this field is covered by only one package available as a single entity.

STUDIO SOFTWARE

BUSCOM-2, Studio's Wages System is, like the others, available on both cassette (£19.95) and disk (£21.95).

Butcher, Baker and Candlestick maker

Dedicated software for the Commodore 64 is relatively abundant chiefly thanks to Galaset. But make sure you know something about micros and what you realistically need before buying because prices vary dramatically.

The Packages

THE COMPUTER ROOM

Supernews is the only Newsagent's Package available on the '64. But you'll have to pay for the privilege – £499 to be precise!

Company Addresses

Kuma Computers
11 York Road
Maidenhead
Berks SL6 1SQ
Tel: 0628 71778

Micro Simplex
8 Charlotte St West
Macclesfield
Cheshire SK11 6EF
Tel: 0625 615000

Precision Software
4 Park Terrace
Worcester Park
Surrey KT4 7JZ
Tel: 01 330 7166

Rabbit Software
380 Station Road
Harrow, Middlx
HA1 2DE
Tel: 01 863 0833

Simple Software
15 Havelock Road
Brighton
Sussex BN1 6GL
Tel: 0273 504879

GUIDE TO '64 BUSINESS SOFTWARE

DDM

In their Factory Manager 64 range, DDM offer *Production Management* as well as a 'Stock Control' and 'Assemblies Option'. It costs £138.00 and provides a full record of progress on individual jobs.

GALASET

A group of competitively priced dedicated packages are available from Galaset. In price descending order these include *TOTL Research Assistant* at £35.95 on cassette and £38.95 on disk. As the name implies this set of programs keeps track of reference data and creates keyword cross reference lists.

TOTL Time Manager also lives up to its title; allowing you to create personal and business schedules, calendars of events and checklists of activities. It is available on cassette at £34.95 and disk at £38.95.

Galaset's Club Secretary package is *The Club Lister* on cassette at £15.95. Essentially a simple database maintaining a list of members, addresses, phone numbers and subscription details.

For Stockbrokers and shareholders Galaset supply *The Stock Ticker Tape* on cassette at £15.95. Again, a simple but effective database which maintains a profile of your investments, their gains and losses, with related information including broker commissions.

Finally, from Galaset a competitively priced computer calendar called *Calendar My Appointments* on cassette at £15.95.

So, happy hunting. I hope this resumé will put you onto the right trail by signposting possible directions, but further time spent analysing your needs and the software brochures will not be wasted in the long term.

Program Generator

A device to enable buyers to write their own interacting sets of applications programs, without having to learn a special language. Remember though, that you will still need a fairly detailed understanding of computers to decide, and tell the computer, what you'd like the program to do.

The Packages

DYNATECH

The only program generator currently available for the 64 is called *Codewriter*. It consists of a "well written manual" and two disks and costs £125.00.

Shore Industrial Plastics Ltd
1-13 Corsham Street
London N1 6DP
Tel: 01 251 0432

SPT Electronics Ltd
Tollesbury
Essex CM9 8SE
Tel: 0621 868484

Studio Software
Wootton Hall
Wootton Wawen
Warwickshire
Tel: 056 42 3467

Supersoft
Winchester House
Canning Road
Wealdstone
Harrow
Middlesex HA3 7SJ
Tel: 01 861 1166

Viza Software
9 Mansion Row
Brompton
Gillingham
Kent ME7 5SE
Tel: 0634 813780

Wego Computers
22a High Street
Caterham
Surrey CR3 5UA
Tel: 0883 49235

INDEX TO VIC BUSINESS SOFTWARE

Name	Function	Disk/Cass/Cart D C Cart	£ inc. VAT	Memory Expansion Required	Supplier/ Reference
Quick Brown Fox	Word Processing	Cart	£60		**SPT Electronics Tel: 0621 868484**
VIC Rel	Relay Cartridge	Cart	£37.95		**Kobra Tel: 04912 2512**
VIC Graf	Graphing Package	Cart	£28.75		
VIC Stat	Statistics	Cart	£28.75		
VIC Forth		Cart	£37.95	3K inc	
Vicalc	Programmable Calculator	C	£8.95		**Audiogenic Tel: 0734 586334**
HESCOM	Programmer's Tool	C	£8.95		
Wordcraft 20	Word processor	Cart	£125	8K inc	
***DAX* Database**	'Name & Address' package	C	£5.95		**Cass Concerns Tel: 0582 598877 010 31 20238512**
Post	Prints enlarged characters	C	£9.99	8K	**The Computer Room Tel: 0732 355962**
Sprint	Simple word processor	C	£9.99	8K	
Label	'Name & Address' file	C	£9.99	8K	
Car Sales	Quotations & Financial statements	C	£39.99	8K	
Flow	Flow Chart program	C	£9.99		
Database Management system	Card Indexing	C	£19.95		**Gemini Marketing Tel: 03952 5832**
Stock Control		C	£19.95		
Mailing List		C	£19.95		
Invoices & Statements		C	£19.95		
Commercial Accounts	Sales & purchase ledger, daily journal and bank account	C	£19.95		
TEXT	Word processor	C	£16.95	16K	**Honeyfold Software Tel: 01 449 3690**
TEXT	Word processor	D	£18.95	16K	
TOTL LABEL	Labelling package	C	£14.95	16K	
TOTL LABEL	Labelling package	D	£16.95	16K	
PAYROLL	Payroll package	C	£19.95	16K	
PAYROLL	Payroll package	D	£21.95	16K	
VICstock	Inventory control	C	£19.95	16K	**Northern Ireland Computer Centre Tel: 023 17 6548**
Inventory Control	Inventory control	D	£55	16K	
DataBase		C	£8.05	8K	**Pedro Computer Services Tel: 01 250 1481**
BusVIC-1	Accounting program	C	£19.95	8K	**John Probert 05642 3467**
BusVIC-1	Accounting program	D	£22	8K	
BusVIC-2	Wages system	C	£19.95	8K	
BusVIC-2	Wages system	D	£22	8K	
BusVIC-3	Retail system	C	£19.95	8K	
BusVIC-3	Retail system	D	£22	8K	
BusVIC-4	Stock check system	C	£19.95	8K	
BusVIC-4	Stock check system	D	£22	8K	
Rabbit Base	Database	C	£14.99	8K	**Rabbit Software Tel: 01 863 0833**
Rabbit Writer	Word Processor	C	£16.99	8K	
Rabbit Calc	Financial planning	C	£19.99	8K	
Simply Write	Word processor	C	£40.25	16K	**Simple Software Tel: 0273 504879**
Simply Write	Word processor	D	£46	16K	

INDEX TO VIC BUSINESS SOFTWARE

Name	Function	Disk/Cass/Cart D C Cart	£ inc. VAT	Memory Expansion Required	Supplier/ Reference
VIC Stock Control		C	£19.95	8K	
VIC File	Database	D	£24.95	16K	
VIC Writer	Word processor	D	£24.95	8K	**Commodore**
VIC Writer	Word processor	C	£19.95	8K	**Tel: 0753 73638**
SimpliCalc	Calculator	D	£24.95	16K	
SimpliCalc	Calculator	C	£19.95	16K	
Data Manager	Database	C	£9.95	16K	
TOTL TEXT	Word processor	C	£17.95	16K	
TOTL TEXT	Word processor	D	£19.95	16K	
TOTL TIME MANAGER	Word processor	C	£19.95	16K	
TOTL TIME MANAGER	Word processor	D	£22.95	16K	
TOTL Mailing List & Labels		C	£12.95	16K	
TOTL Mailing List & Labels		D	£15.95	16K	**Galaset**
TOTL Research Assis		C	£19.95	16K	**Tel: 01 549 8229**
TOTL Research Assis		D	£22.95	16K	
VickyCalc	Spreadsheet	C	£11.95		
Stock control		C	£11.95		
Stocks & Shares Portfolio	Stocks & Shares recorder	C	£11.95		
Cashflow Model		C	£11.95		
Computer Calendar	Diary printer	C	£11.95		
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MICROSCRIPT

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In the many pages of SUPERSOFT's Winter 82 catalogue (no we don't have a new one yet, but then it still seems like Winter 82) you'll find innovative PET products like MATRIX BASIC (£75) and INFINITE ARITHMETIC (£25) for the mathematically minded. There's BACKGROUND MUSIC (£18) for the musicallyminded, and for the bloody minded a whole range of adventure games that will tax you persistence and test your sanity. For only £8 you can choose from a large range of arcade games including CRAZY KONG, SUPER GLOOPER, MANGROVE, or two games for the price of one CLOUD HOP & BREAKOUT. Spend a little more (£10) and you can buy SCRAMBLE — it's ace!

We reckon that only 25% of PET owners in the U.K. are on our mailing list. So come on the rest of you, let's have your names and addresses pronto. Though more and more of our advertising is aimed at 64 owners we're not going to discontinue our three hundred PET programs, accessories and peripherals.

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We see the Commodore 64 as the successor to the PET — so we're working furiously writing and converting programs so that 64 owners can benefit from our years of experience. Already available for the 64 we have arcade games like STIX, TANK ATAK, MANGROVE, and KAKTUS (all £8) and adventure games including GOBLIN TOWERS, CRACKS OF FIRE and COSMIC CAPERS (£12 each).

Business users ought to consider BUSICALC which at only £39 is one of the easiest spreadsheets on the market — but one of the most useful. And programmers may well need the VICTREE cartridge (£65) which adds over 40 useful commands. ARROW is a cartridge that for only £39 allows you to LOAD and SAVE programs on the Commodore Datasette at virtually the speed of the 1541 disk drive! These and many other exciting products can be found in our latest 64 list — so why not phone for your free copy.

ADD 15% VAT TO ALL PRICES — POSTAGE FREE — PHONE FOR A FREE CATALOGUE

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You may not even have heard of typography, but as microcomputer screens and printers get more sophisticated and versatile, the science of communicating information through text design is becoming increasingly important. *Richard Finlay* explains...

WHY MICRO USERS NEED TO KNOW ABOUT TYPOGRAPHY

To the person-in-the-street (get out of the street, you fool) typography is a mixture of geography and typing, the typographer, one who measures the annual fingerfall on the shifts and backspaces of a qwerty keyboard and reports back to *National Typographic* with photos of the natives. Well, by the end of this article, you should be able to understand the difference between a photocomposer and Ludwig van Beethoven, between Caxton and Paxo, and between Times New Roman and Old Spice. Here is all you ever wanted to know about typography, but were afraid to ask.

• What is a typographer?

A typographer, or typographic designer, helps people to communicate, through written, printed, or displayed words and pictures. Suppose a firm wants to communicate its sales figures to its shareholders. How should they best be presented? As a graph, a table or a pie chart? Or all three? Will the use of colour make them easier to understand? What typeface should be used for the text? How should the information be laid out on the page? Should pages be used at all – maybe screened teletext would be better? Hundreds of decisions have to be made when an author wants to present even straight forward information to a reader. Some of these decisions are almost trivial, others crucial. Many of them cannot be made without some understanding of the technology involved and the psychology of the readership: these are the interests of the typographer, who applies knowledge and experience to the problem of how to present information in a visual, or 'graphic' form. Although much information requires a visual form which combines text with diagrams and pictures, the typographer's main concern is with the textual aspect.

We are exposed to the typographer's work every day through magazines, books, newspapers, television, billboards; through all the media of visual communication. The documentation that (hopefully!) accompanies your computer and its software may be genuinely helpful or totally unapproachable depending on the way the typographer (if indeed there was one) has handled the task – how many times have otherwise favourable reviews of new products bemoaned the instruction manual with no index or contents page, or with indecipherable instructions?

• Typography and computing

"This is all very well," I hear you saying, "but what's it really got to do with me?" Well, computers today are very little to do with calculating machines and much more to do with chucking bits of information about. Even with accounting or other calc software, the user may well be as concerned with the way the results are presented as with what they are.

Some specialized computers produce output in the form of electrical control signals to other machinery, for example in an automated production line. The great majority churn out information in a form intended to be read and interpreted by humans. Clearly, many of the lessons of good typographic design, learnt through presenting information in a printed form, can be usefully applied to computer output. Information on screens and in the form of hard copy needs to be designed with just as much care as printed work. In fact, now that databases are replacing newspapers and journals in so many fields, typographers are beginning to shift their attention to the new problems posed by computertized information technology. Typography has become synonymous with information design.

In a sense, this is overdue. It has long been possible to manipulate the layout or 'format' of information to make it easier to read and understand, using facilities available on even the cheaper micros. (You wouldn't think so, looking at the output from some software packages.) Despite this, typographers ignored the problems of computer-based information design, observing that there were still severe technological constraints on presentation. With limited resources, a typographic designer can do very little more than avoid the extremes of illegibility and incomprehensibility: worthy but under-appreciated work. Maybe it was felt that the manufacturers were making the best of a bad lot and there was little typographers could do to help.

Today, at the top end of the information technology market, high-resolution screens, sophisticated hard copy output, and the glamour (!) of viewdata has begun to attract typographers into the specialized area of computer-based information design.

But the micro user is still getting a raw deal. Over the last few years, the micro has been put to uses which it was ill- ▷

equipped to handle typographically. First it was word-processing; now even greater demands stem from the needs of office information systems, data bases, financial modelling, and so on.

New developments

Recently, however, the new generation of 16-bit micros have begun to offer a high degree of control over important typographic details: fine increments of vertical and horizontal space, the variable character shapes and styles ('typefaces') both on screens and on hard copy output. (This sudden leap in sophistication is discussed in a separate panel.)

These developments allow, for the first time, the possibility of really high-quality typographic design in micro-computer applications. And, conversely, it will *take* these developments and the growth in applications to get information designers to deal with their associated problems (just as the discipline of typography itself came of age with the information explosion of the last hundred years).

Our hope is that the manufacturers (of both hardware and software) have cottoned onto this, and are seeking the advice of specialist designers when it comes to character design and layout.

But for the micro owner and user, an introduction to typography may help you decide what features are really going to be useful when you go to buy a word processing package. Or it may help you choose a printer which will offer you all the quality you need, without those redundant extras ("I think you'll find, sir, that the range of several hundred typefaces really will come in handy.").

Of course, you might simply be interested in typography anyway...

History and theory

Typography as an independant discipline was called for by industrial growth, and gained acceptance under the modern movement of design. It is an equivalent growth in computerized information which calls for the services of the information designer now.

Today's interpretation of 'design' stems from a principle born in America at the end of the nineteenth century, and encapsulated in the catch-phrase 'form follows functions'. The appearance of a well-designed thing will reflect its purpose in life. An office building should not look like a Greek temple: classical columns and triglyphs were designed to serve a different purpose, and will almost certainly get in the way of the window-cleaner. Similarly, an annual statement of income and expenditure should not look like a cross between a greetings card and a sweet wrapper (unless, perhaps, it is for a company which makes them!).

What is the primary function of a piece of visual information? To convey meaning. Underlying that is the reading function: the information should be legible. And finally there is an 'expressive' function: this is also part of

FROM CAXTON TO PHOTOSETTING

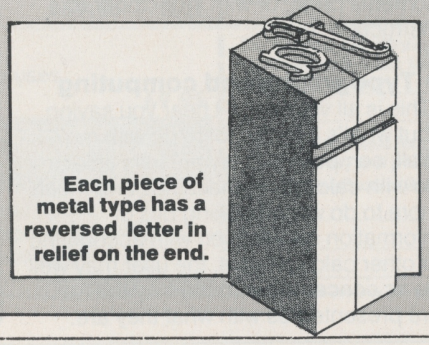
A brief history of printing and character formation.

The history of printing is an important part of our story for three reasons. First, much of the technology of printing has been carried over into computer applications. Second, the visual form of printed information is the accepted norm which computer output is expected to emulate. And third, computers are taking over the job of widescale dissemination of certain information which printing has performed for over five-hundred years.

Innovations in the technology of printing and in word processing have been prompted by the same requirements: reproduction in quantity, at speed, with acceptable quality, of a master copy which can be edited and stored. This panel summarizes the technological history.

We're particularly interested in one aspect of printing: the way the image of characters and picture elements is formed. Originally, the image was itself the printing surface and had to be physically constructed from blocks of lead 'type'. Today, virtually any image can be reproduced because the printing surface is constructed from the image by photographic or similar means.

Johann Gutenberg invented the process of printing from moveable type in the city of Mainz around 1450. The process involved metal type which carried the shape of the character in relief and in reverse on the end. The type was set up, or *composed*, in the right order, locked tight in a frame, and inked up. An impression was taken on paper using a screw press, and further identical impressions were simply a matter of inking the type again.



Each piece of metal type has a reversed letter in relief on the end.

Here are the beginnings of word-processing – speedy production of identical copies of information.

Proportional spacing was built in – it had to be for printing to imitate the style of the manuscripts which it was trying to oust. The piece of type for a letter 'i' was narrower than that for an 'm', and the results looked good no matter what order the letters came in. You could print any character or shape that could be cast in type. If the image included a drawing or a diagram, it had to be sculpted in relief out of a block of hard wood which could be locked in with the type.

Though it now seems primitive, Gutenberg's invention changed the nature of information and communication. It soon spread all over Europe – William Caxton brought it to England in 1476.

Toward the end of the eighteenth century, the development of modern industry and commerce brought an associated tidal wave of printed matter: stationary, advertising, newspapers. Speedier printing was called for, and the technology was there: the first steam-driven rotary press appeared in 1814 at *The Times* newspaper. Faster composition was also achieved mechanically – the *Monotype* machines of 1897 cast new type under the control of a paper tape which had been punched by keyboard.

The invention of photography in the period 1850-64 led to the making of printing blocks by photomechanical means. Not only could line drawings and photographs themselves be easily reproduced, but the process of character generation and composition became independant of the final printing surface.

Three-dimensional metal type was no longer needed; as long as the characters could be presented to a camera in their correct order, the printing surface could be produced.

However, the development of *photocomposers*, whose output took the form of exposed photosensitive film or paper, only got under way in the 1930s. It was not until the late 1950s that photocomposition became commonplace. These machines evolved from systems which projected miniature 'slides' of character shapes to those of today which 'write' the character shape onto film using a laser spot or CRT scan.

When composition became an electronic rather than mechanical process, the door was open for computer control. Character shapes and widths are stored as data: the latest systems can have many different typefaces with large character sets on-line at any one time. Composition speeds have soared. There is a direct link between these developments and those of non-impact ink jet and laser printing for hard copy output. ○

ANYONE FOR SANSERIF?

A look at how typefaces are designed.

Technology and typography interact closely in the history of type design. The relationship continues today as computer designers try to expand the range of faces and styles available in computer output media.

The first typefaces of Gutenberg's era copied the handwriting in the manuscripts of the time. If the printed book was to compete with manuscripts, it had to look similar (there was resistance to change even then!)

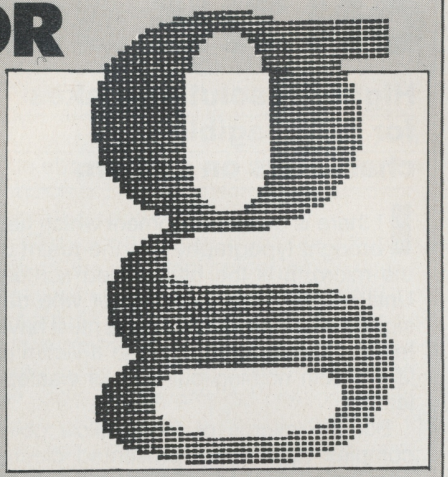
Typeface designs evolved very gradually over the next 300 years, until the industrial age when each business wanted a new and distinctive typeface to establish its own 'corporate identity'. Suddenly the evolution accelerated, and the technology had to respond to the need for quick production of new typefaces. In turn, certain characteristics of the machine-cut face (for example, the rounded corners enforced by milling tools) suggested new designs.

The increasing complexity of information called for families of type – a range of related styles and weights which belonged together. The typographer uses these to reveal the structure of information, giving emphasis where necessary, differentiating levels of text by size or weight, and treating related data in a consistent style.

Today, we are in an exceptional position, in that all the type faces of the last 500 years are available to us. A modern photocomposition system may offer versions of all the classic designs: *Gothic* and *Bemo* of the 15th century, *Garamond* of the 16th century, *Baskerville* of the 17th century, and *Bodoni* of the 18th century. The innovations of the industrial age are commonplace: *Sanserifs*, *'Egyptians'*, and a wide range of decorative typefaces. And the 20th century has given us the familiar *Times new roman.*

There are literally thousands of typefaces available to the printer. How far should computers go towards matching this capability? It is important to remember that, at present, computer-based information is not required to perform exactly the same functions as its printed counterpart, nor are micros anything like as capable as printing systems. The driving force in computer output is the need for speed, a parameter which printing can afford to compromise for the sake of high resolution and quality.

For computer applications, the typographical needs are this: one or two typefaces, in a limited range of sizes, but with the options of weight, and style; and easy manipulation of vertical and horizontal space. Together, these allow quite complex information to be clearly presented in a visual form.



Example of a digitised character.

Garamond
Bodoni
Egyptienne
Univers
Times

Various type-styles from the past four centuries.

Manufacturers use the issue of variety of typefaces to sell new computers – it's the most obvious but actually least important characteristic. Many users would gladly trade off variety of faces for a larger character set – allowing, for example, foreign language characters or mathematical symbols.

Given the fact that only one or two faces are required, one would have thought that they could be well designed, though sadly this is rarely the case. It is especially ironic when character designers today work with the aid of computers. Character design systems, which carry such momentous names as ICARUS and METAFONT, allow the designer to remove individual elements from a 'digitized' character description (see picture). These changes, or 'edits', are themselves stored allowing the designer to match adaptations of one character to all the others in the set.

For the layman, computers and type design come together in those funny shaped characters on cheques, or that 'futuristic' face they use for low-budget sci-fi serials (and cereals). These belong to that family of machine-readable faces, intended to overcome the slowness of keyboard input. Today, *optical character recognition* (OCR) is sufficiently advanced to handle virtually any well-printed typeface, and they're working on handwriting. ○

conveying meaning, but through the reader's subconscious response to overall style.

Typographic variables

In more general terms, the aim is to use *typographic variables* of space, size and weight (boldness) of type, colour, and so on, to help the reader grasp the meaning and structure of the content. Unfortunately, in many cases, the opposite is achieved: the copy is forced into some predetermined shape or colour resulting in an elegant piece of information which is consequently impossible to understand.

In practice, typographic variables are only as variable as technological, economical and other constraints allow. There is often a conflict between what is desirable and what is possible or practical. The typographer has to reach an acceptable compromise and this is why the task of designing is also defined as 'problem solving'.

Which typographic variables are available in computer output? Remember that the technological constraints of screen displays and hard copy output devices limit the freedom normally available in conventional printing. Also, there are some things hard copy output devices can do which can't always be duplicated on screen and *vice versa.*

This is a regrettable fact. In the past, screens and hard copy output devices were used for different kinds of output: screens for information in a temporary or intermediate state, hard copy for permanent, final information. Modern applications ignore this distinction. The better word processing programs, for example, show the document on the screen in exactly the same form in which it will be printed. Today's computer industry is trying to bring the capabilities of the two media to a higher and more

Space:	Horizontal fixed width Proportional vertical
Colour:	**red blue green magenta cyan yellow white black, and maybe other colour of background**
Face:	HELVETICA, TIMES **ROCKWELL, etc. etc.**
Shift:	UPPER CASE and lower case,
Weight:	**Bold,** medium, light
Style:	Roman, *italic*, underlined
Size:	small, normal, large
Proportion:	Condensed, Normal, Extended

Typographic variables ▷

closely matched standard.

All systems allow some control of *space* between characters, between words, between lines and paragraphs – vertical and horizontal space in other words – though at present the degree of control is rather greater for printers than screens.

Colour is more likely to be available on screen than in hard copy form, and in contrast to the other variables is an 'extra' variable not normally available in print media without considerable expense and effort.

Most systems offer a choice of *CAPITALS or lower-case* characters, both on screen and in hard copy output. They are considered part of the standard character set. But when it comes to choice of typeface, character size, style and weight (see picture) the limitations are considerably different for printers and displays.

The freedom to select, *at any point in a document*, style, weight or size of a range of faces is limited to screened displays on the newest and more expensive 16-bit micros. Yet some flexibility of character selection is highly desirable from a typographer's point of view, especially for complex information.

Apple's LISA seems to have set the standard for versatility: a limited range of two or three sizes to distinguish headings from text; two different faces in the large sizes; the all-important family of **bold,** *italic,* underlined, and combinations of these, allowing for emphasis and what we could call different 'tones of speech'; and proportional spacing, albeit crude by printing standards. We have no need for any more than this. As the promotional blurb says: 'Lisawrite gives you the typestyle options you need to make communications clear and dramatic'. Or, they forgot to add, confusing and messy, if you're not careful! (*Ed: – See the Mouse Graphics feature last month*).

The LISA also highlights the most pressing problems that the manufacturers have yet to tackle. The large size faces are extremely crude, and are prime examples of appalling character design; the solution involves professional character designers, higher resolutions, and finer proportional spacing. Because of the low resolution, the variety of typefaces at normal text size are too similar to offer much advantage.

The introduction of subscripts and superscripts is just a start on the problem of increasing the character set to allow, for example, mathematical or foreign language work – this is an option in print which is desperately needed in microcomputer output.

• Theory into practice

We are now in a position to look at how these typographic variables are used in typical micro applications, and how the limitation on their variability force a compromise of 'ideal' design standards. The discussion takes the form of guidelines for improved design.

ON THE SCREEN...

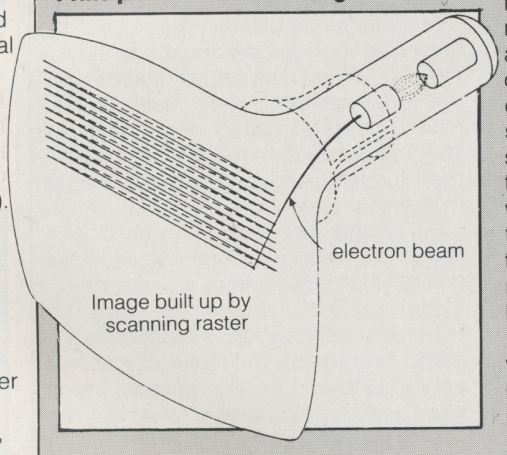
Higher-resolution makes for more legible characters on screen.

If there is one development which has brought typography into the realm of the micro, it is the bit-mapped screen. Until recently, the typographer who designed information for screens must have felt like a doctor attending to a victim of 'Jaws' with nothing but a tin of elastoplast!

But the micros of today allow quite complex data to be presented clearly and concisely. For the first time, screen information is beginning to compete with printing at the low end of the market. What is the cause of this revolution?

There was a time, not very long ago, when screen output from computers wasn't up to much. People talked to their machines by teletype, and the reply really did look like the early sports results on telly. The only screens to be seen were oscilloscopes which were slow and consequently limited. If you wanted a simple wave form, fine; but to draw even one character took so long that by the time it was finished, the starting point had faded away. In other words, the 'refresh' time was too long, and the resulting display would flicker disarmingly (or do I mean il-'leg'-ibly?).

Principle of raster-scanning.



Raster-scan screens changed the problem from 'drawing' a character with an electron beam to switching the beam on and off in the right places as it flew across the screen 625 times every 1/25 second. That meant lots of memory, and it wasn't until the mass-produced chip and consequently cheaper, larger ROM that characters on screens became the norm.

Today, there are four different classes of character display, which graduate in sophistication and price.

In the first type, data descriptions of the dot-matrix characters are stored in character-generator ROM, along with the software to extract that data in the right order to 'write' text onto the screen. With a typical resolution of 7x8 dots, descenders on a 'g' or 'y', which are meant to stick below the line, don't. This doesn't do much for legibility, and it rules out the possibility of more than one typeface or style, but its a start. The screen is divided up into fixed character positions, maybe 40 across by 20 down, so proportional spacing or ½-line feeds are out of the question, as are multi-column tables and sensible word processing (though scrolling may help). The PET, Apple II and cheaper Tandy computers are examples of this kind of display.

Cheap RAM as in disks and chips, resulted in the second class of display. The character generator is no longer fixed at the factory and with the right software you can redesign characters within the matrix, which may have grown to a more versatile 8x14 or similar. This allows you to create special characters, so that pressing the '&' key might give you a favourite Greek letter or part of your very own space invader instead. The higher-resolution matrix might suggest the introduction of a second typeface, though the character set is limited by the byte size: introduce 52 bold characters and you'll have to dispense with numbers, punctuation and most other useful things. The screen is still divided into fixed character positions. The Commodore VIC-20 is the best-known example of this class.

A spin-off from graphics gives us our next class of character display: the bit-mapped screen. Machines of this sort allow you to switch individual pixels on or off. Technically, such a display introduces the possibility of proportional spacing, and assorted weights and styles of character. But the versatility is intended for graphics, or typographics. So we get machines with sophisticated picture drawing functions but a fixed character display of, say, 40 columns by 25 rows. Or the memory may be too small to hold more than one font. (A font is a complete set of characters in one style or weight.) Or the relevant software may be lacking, even though the hardware is capable. The BBC micro falls into this class.

Our final class of display gives the typographer something to work with at last: the 16 or 32-bit flexible font system. Here, the bit-mapped screen is used to its full advantage. A range of faces, styles and weights are built in. In some cases, proportional spacing is included. Screen resolution is, of course, higher than before. (You can't use a TV set as a screen.) The Sirius 1 was the first mass-market machine with this facility, though the State-of-the-Art is now represented by Apple's LISA. In the past, memory size set the limit on typographic versatility. Today its the cost in man hours of writing the software.

○

...AND IN PRINT

Lasers and ink-jets could replace the old existing computer printer technologies.

When it comes to printers there are two dimensions by which we can measure typographic capability. First, to what extent does the printer output resemble the page you can see on the screen? Second, how versatile is the printer in its own right?

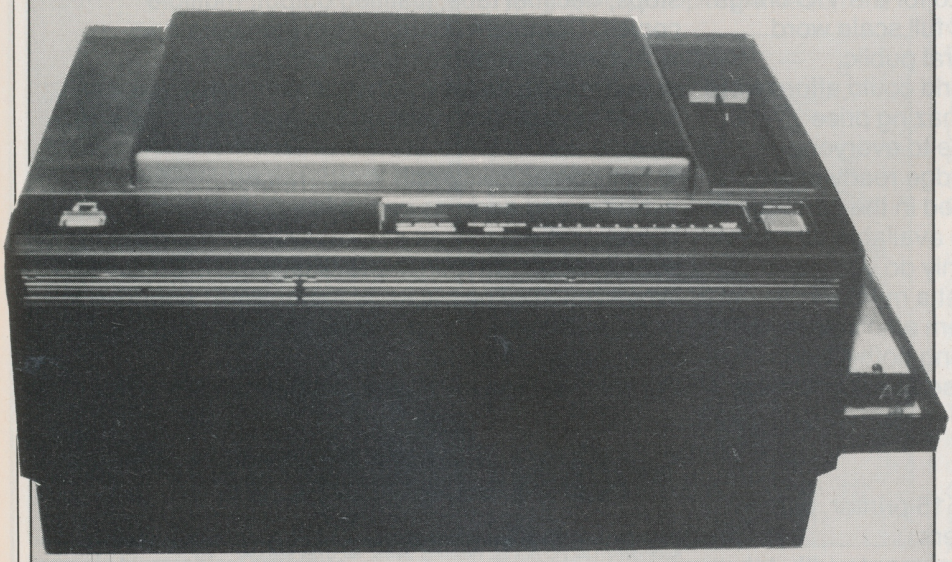
In this section we'll assess three different classes of printer according to these criteria. Many of the characteristics of printers have already been discussed in the May 1983 issue of *MicroComputer Printout*, which you should read first if this is unknown territory.

Our first class, the dot-matrix printer works by impact, heat or electrosensitivity. From the typographer's point of view, its worth is proportional to the resolution of the matrix. If the dots are finely spaced, then the printer will probably be able to do all that the screen can, and more. This is what IBM means when they say 'all points are addressable' in their personal computer printer. With a coarse matrix, say 7x9 dots, the character designer will find it nigh on impossible to create alternative fonts, so you can say goodbye to bold and italic, and therefore high-quality information design. However, there's not much to stop you expanding the character set to include all sorts of special symbols and foreign language characters. An underlining facility can make up for the absence of italic. You may well get a choice of size and pitch, though proportional spacing is rare.

The second class of printer is impact only – the solid font printer, which uses a daisywheel or print thimble with the character shapes cast on. As far as character set goes, you're limited to however many you can get on the print head. In effect, you've only got one font available – if you want a choice you have to change the print head. However, overstriking can result in a passable bold, and underlining may also be possible. Proportional spacing is common. The quality is good, but my own feeling is that the days of the solid font printer are numbered. You can't match the capabilities of a 'soft' screen with a 'hard' printer.

So we come to our third class – the non-impact high resolution printer. Lasers and ink jets match the resolution of the finest screen. Choice of fonts is again a matter of software design rather than hardware capability. This technology is just breaking into the personal computer market, though it is too early for software designers to take full advantage of it. But the day is not far off when the flexible font system will allow high-resolution character output to the same standard on both screens and printers. Even colour, the great divider, is a foreseeable development. ○

The Lombard L30 Laser Printer is of the non-compact high resolution class, which will in the future offer flexible font systems, high resolution and ultimately colour to a computer's hard output.



• Legibility

First, we can state some of the findings of research and experience which relate to general legibility.

Typeface – when it comes to dot matrix characters, the rule is: the more dots per character, the more legible. For daisywheel printers which offer different type wheels, you're safest with a normal typewriter kind of face.

Character size – This is one thing manufacturers usually get right, largely thanks to standards originally established by defence research in the 1960s. If you go for a large size, you may need a wider screen to get an acceptable number of characters per line (see below).

Proportional spacing – the facility allowing characters to occupy different amounts of space, depending on their shape. This greatly enhances legibility, partly because spaces between words are also variable making *justification* acceptable.

Capitals vs lower case – in most applications using words as opposed to codes or numbers, lower case is more legible than all capitals.

Line length – lines of about 55-70 characters are recommended for text. Less than that and your eyes tend to jump too far down the page when returning to the left margin after reading a line. More than that and the opposite tends to happen – you re-read the same line.

Space –the space above and below a line of text is as important as the text itself for guiding the reader's eye along the line. If the space between words is greater than that between lines, or only slightly less, there is a tendency for 'rivers' of space to open up in the text. From this we derive a general rule of legibility: inter-character space should be less than interword space, which in turn should be less than inter-line space.

Justification – this is one of those bits of typography which everyone has strong views on, often misguided thanks to advertising hypes. Justification is used to get straight left *and* right hand edges to text (unlike this article, which is set 'ranged left, ragged right'). It's a convention which belongs to printed books, not word-processed correspondence, yet it is often the default standard in commercial software.

In general, fixed width systems achieve justification at the expense of legibility. If the line length is short, the problem gets more acute because there will be few word spaces which will all have to be opened up that much more. This can lead to those rivers of space even in proportional spacing systems.

Colour – obviously good contrast between text and background is important. ▷

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Layout

Some of the above recommendations for legibility apply only to prose information, others set standards whenever characters are used. Having satisfied the requirement of legibility, the visual form of an item of information must also support the structure of the text. This is where layout design comes in.

Heirarchical structure – We're used to this kind of thing in books: chapters divided into sections, sections into subsections, and so on, each level carrying its own headings. Similar structures occur in many computer applications, especially word processing, and data bases: PRESTEL pages, for example, are usually arrived at by going down through successive levels of indexing.

We want to use typographic parameters to reinforce this structure. For example, the highest heading might be in all capitals followed by one line space, the next in underlined lower case, and the next in lower case but indented by a couple of character positions. Some variables have a natural running order (bold to light weight), others have no particular sequence (colour, style).

The most important rule for heirarchical structure is to be consistent. All headings which are meant to be the same level must have the same typographic treatment. Make good use of all the variables available on the system. Some word processing software will automatically set the style for headings – all the user has to do is key in the appropriate level number against each heading. Unfortunately, software designers often make use of only one variable to indicate structure: horizontal space. Each level is indented by a few characters more than the last: at the lowest level the text is indented halfway across the page!

MAIN HEADING

Section Heading

We're used to this kind of thing in books: chapters divided into section, sections into subsections, and so on, each level carrying its own heading.

● **Sub-heading**

We want to use typographic parameters to reinforce this structure. For example, the highest heading might be in all capitals followed by one line space.

● **Sub-heading**

The next in underlined lower case, and the next in lower case but indented by a couple of character positions.

Example hierarchical structure.

List structure – the option menu is the obvious example; also an index of files, or disk contents. Program listings are a special case. Consistency is again the key note. Each item is the obvious example; also an index of files, or disk contents.

Each item in a list is of equal importance, so should have equal treatment typographically. The other criterion is that each item is clearly separated from the next. In those cases where each item within the list is several lines long, it would help to mark the changeover from one entry to the next. The first line of each item might carry a bullet (●), or it could be indented by a couple of characters. Designers of screened information have taken advantage of the fact that some colours give roughly equal emphasis: successive items are displayed in alternate colours.

LIST

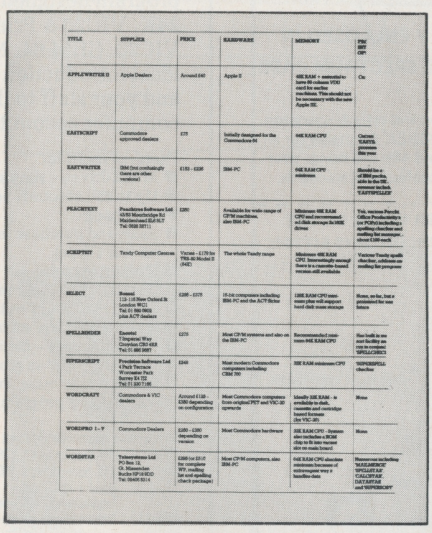
- **J & R Typewriter Services**
  246 Imperial Drive
  Rayners Lane
  Harrow
  Middlesex
  01-868 3345

- **ADOS Limited**
  College Wonce
  King Edwards Road
  Ruislip
  Middlesex
  HA4 7AE
  08956-72661

- **Ashford Computer Co Ltd**
  2 Station Parade
  Clarendon Road
  Ashford
  Middlesex
  07842-44955

Example list structure.

Matrix structure – accounting software, calcs, and some data bases output information in matrix or table layout. Typographic principles derive from the fact that a table is a kind of two-dimensional list. Consistency, and clear separation between 'cells' of the matrix are the two chief concerns. Column and row 'headings' are one level up from the data within the table and should be treated accordingly.



Example matrix structure.

• Conclusion

It will be apparent that a lot of typographic design is simply a matter of common sense: many of the principles discussed above seem ridiculously obvious. Maybe this is why 'information providers' and software designers have not seen any reason to seek the advice of professional typographers. However, the obvious tends to get forgotten. The exchange of information is so automatic that we take it for granted. Good design requires long, hard thinking about the author, the information itself, and the reader, followed by experimentation and the application of experience. The Plain English Campaign reminds us of the appalling lack of standards in public information. We should not let those bad habits carry over into computer-based information.

There are some hopeful signs. Some of the information providers for PRESTEL are taking professional advice, including (believe it or not) the Inland Revenue. The long-awaited development of systems which offer a reasonable degree of typographic flexibility open the door to the output of more complete information and allow high-quality treatment of existing information. The problems of typographic design for computer applications are becoming the focus of attention in the design profession and in university and college courses. *Information Design Journal* (PO Box 185, Milton Keynes, MK7 6BI) provides a quarterly forum for the exchange of news of developments in the field, and is recommended.

Wider circulation magazines (especially this one!) discuss typography in connection with documentation, character design, and information layout. It is sometimes these issues alone which distinguish one micro from another when they seem to belong to the same class.

You can read more about legibility in *The Visible Word* by Herbert Spencer (Lund Humphries, London, 1969), and about typographic variables in *Compendium for Literates* by Karl Gerstner (MIT Press, 1974).

There is only one way to really get thinking about practical typography: try designing some information yourself. Copy a page of output from PRESTEL, or from some software package. Re-keyboard it, changing the use of space, colour, of any other typographic variable. Try new layouts. Restructure the information. You'll be surprised how often you'll realise that good, careful design can greatly enhance the value of your computer to you as a word processor, information terminal, financial modeller, time saver and tool for thinking. ○

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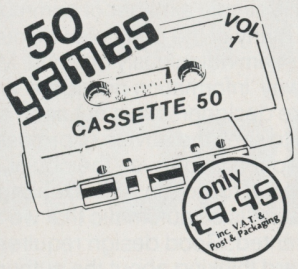

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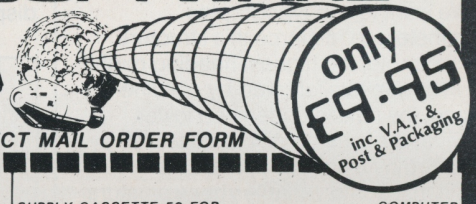

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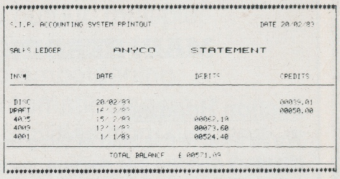

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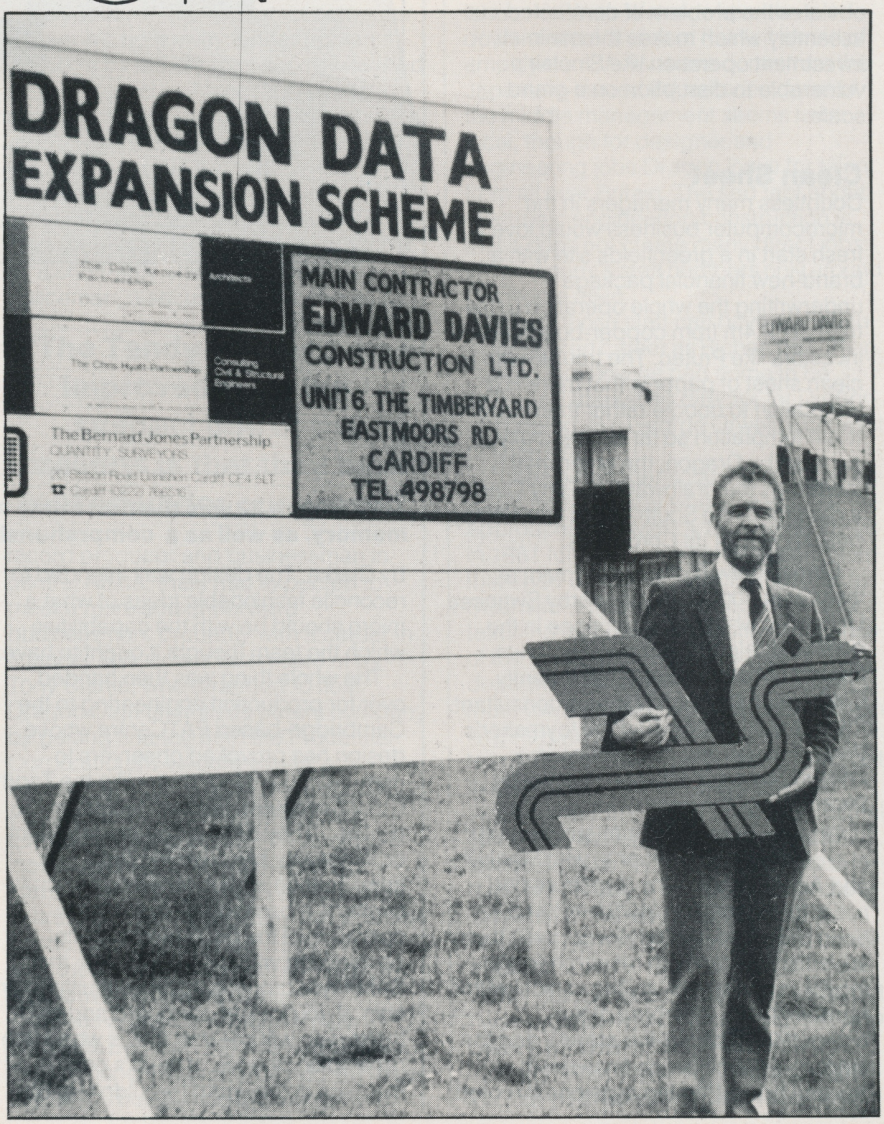
MARTIN HAYMAN'S

PRO FILE ON

In just nine months the Welsh-manufactured Dragon 32 is now competing with the BBC Microcomputer for the status of best selling upmarket home computer. As with any new company, much of the success can be put down to the flair of the individuals who mastermind it. Designer and now Marketing Director, Richard Wadman's background in the military, security, record producing and African business fields, have matured into an intriguing philosophy of the role of the microcomputer in politics and private lives.



There's more room at the end of the corridor, runs the advertisment for the joys of employment in Britain's Silicon Strip. Britain's counterblast to California's promised land runs from the west of London along the M4 past Heathrow and its sprawl of conference oriented hotels ready to receive the whistle-stopping executive en route to other hi-tech centres in the world; on westwards

through Reading and Maidenhead, taking in Cheltenham, its image tarnished by security lapses from GCHQ and Linotype Paul's closure of its British operation; and on across the Severn Bridge into the valleys of Wales, where coal mining and metal bashing have only in small measure been replaced by electronics assembly operations for the Japanese giants Sony, Matsushita (National Panasonic) and Hitachi. At the westernmost extension of the corridor (if you exclude Thorn-EMI's up-valley offices in Treorchy), lies one of Britain's most successful new microcomputer builders Dragon – so named, if the point needs to be made, after Owen Glendower's motif.

Why has Dragon become so successful? How has it risen from nowhere in a couple of years to rival in popularity the BBC Micro with which it is in sharp competition for the hobbyist's hundreds?

The answer is nowhere very obvious. The product is fine, up to a point; the marketing, taking a leaf out of Mr Sinclair's book, enlists the muscle of a high street chain store on its side, and avoids the mayhem of mail-order; production is done under their own roof, in new premises owned by the Welsh Development Corporation, which obviates the problem of contracted out assembly which makes the minimal investment operation like Sinclair's vulnerable to disruption on a grand scale.

Clean Sheet

Doubtless many managers in the microcomputer business would love a fresh start in a greenfields site with a brand-new financial package underwriting the whole operation to the tune of £2.4m from copper-bottomed investors like Prutec. The trouble with a clean sheet of paper is that there is a temptation to doodle rather than design. It is a temptation so far successfully avoided by Dragon, the enterprise started as the brainwave of Tony Clarke, a director of the South Wales firm Mettoy, best known for its Corgi Toys.

Clarke knew Richard Wadman, a lecturer in computing at nearby Swansea University who had experience in the consumer electronics goods market, though not at home and not recently. Clarke recruited him first as a consultant, then as a director, when the toymaker's diversification into micros became inflated like a cuckoo and pushed its parent out of the nest.

After the concept of a microcomputer at around £200 to compete with Sinclair and Acorn (though the Spectrum had not at this time been launched) had been drawn up, the brief was given to an advertising agency to research (done mostly in a series of 'styling clinics' with representative members of the computing public-in-the-street), and the technical specification finalised in several brainstorming sessions directed by Clarke. The design was intended to reconcile fashionable ideas of what a micro should be with the capabilities which the team thought it ought to have.

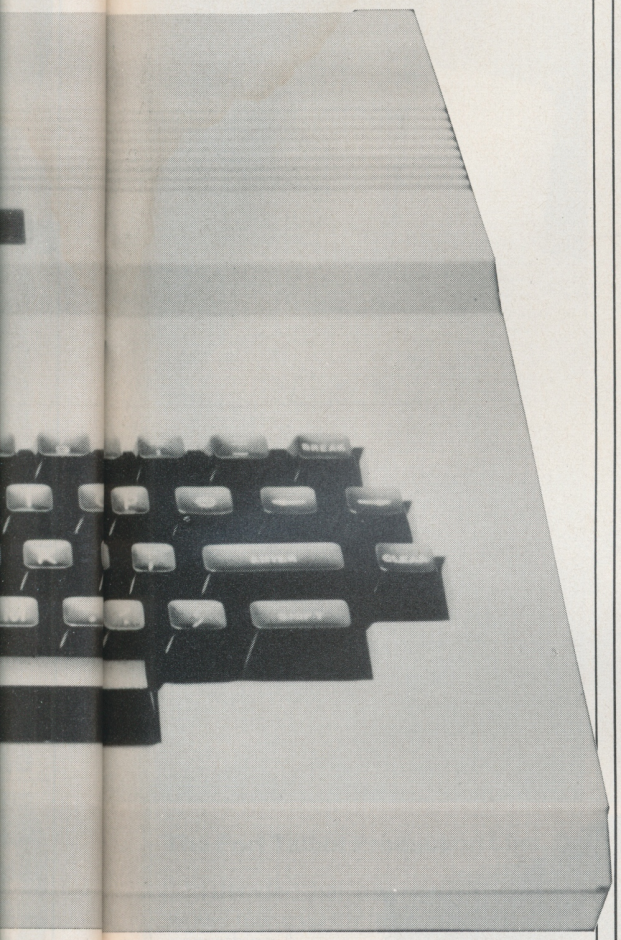
The Dragon 32 was the first home computer to feature a full 32K of memory, as well as a comprehensive BASIC interpreter.

The whole thing was then handed over for production engineering to the Cambridge-based PATCentre whose design has provoked observers to comment that it looks very like the Tandy Color Computer. Richard Wadman replies, "They have a certain degree of commonality because the data specification as published by Motorola contains a basic circuitry for the operation of the 6809 processor in conjunction with the 6883 chip – the SAM (synchronous address multiplexer) chip. If you look at our board and at theirs, you will see that that is where the resemblance ends. If there's one machine in the world I wouldn't rip off, it's the Tandy. It has improved now, but I suspect one of the reasons is that they have looked under our cover".

The Dragon product range is simple. There is the Dragon 32 which in its original form as launched in August last year has been selling strongly – 32,000 by Christmas, when hobby micros really took off (demonstrating good judgement or luck, in the choice of timing for the launch). Dragon predicts that it will sell 400,000 by the end of 1983, and that it will capture 5% of the UK home computer market estimated to be worth £300 million.

Simple construction

Of simple but apparently reliable construction, the Dragon 32 offers a 'professional' type keyboard with keys "guaranteed for 20 million depressions",



the usual ports for joysticks, cassette recorders, cartridges and a parallel printer interface. It displays nine colours in five different modes of resolution, and has a five-octave range sound output. Microsoft colour BASIC is standard.

There is evidence that the package was devised after careful examination of other comparable computers from Tandy, Commodore, Sinclair, and Acorn. This is to be expected. As Wadman says, no one who proposed to launch a new home micro would fail to analyze the competition closely in order to offer the same or better product at a reduced price by improved construction.

Dragon plans for 1983 are also succinctly stated. There will be a disk system, single or double-drive, bought in from Japan or the US – a shame this, because most of the components for the Dragon computer come from Motorola's factory in East Kilbride, Scotland. Capacity of this unit is 180K per drive. The disk operating system 0S9, Pascal and Version 7 C compilers will be licensed by Dragon from Microware in the US. There will be an expansion box giving another 32K RAM, possibly with twin RS232 interfaces. These will make an upmarket Dragon package with a better margin. Promised later is software suitable to run programs written in CIS-Cobol. They will probably run on Dragon's third product, a business machine, which will according to Richard Wadman, the marketing director of the company, offer colour as standard with ample potential for displaying facts and figures graphically, probably a multi-window system with more than 1/4Mb and up to 2Mb main memory.

In essence, then, we have an ambitious young company which, having tasted success in the hobby computer sector, where there is very little room for marketing manoeuvres and slender profit margins, aims to put into practice the lessons it has learned in getting the product smaller, cheaper, lighter and more reliable in the rather fatter and less fickle business market.

Computerate youth

Time will tell whether the techniques which obtain in the consumer computer market will hold sway further upmarket. To judge by the plaudits already heaped on the Dragon machine, and by the number of followers which it is gathering among computerate youth, the answer will quite possibly be 'yes'.

I remarked early in my conversation with Richard Wadman, whose background includes spells in the army as a short-stay officer, as a military policeman, a security expert and as a record producer and businessman in central Africa, that I had expected to meet a more straightforward businessman, probably with a career in finance. This side is taken care of by Tony Clarke, who arranged to float Dragon Data off from its parent company by getting finance from the Prudential Corporations's venture capital arm Prutec (40%), the Welsh Development Agency (22%), Mettoy (18%) and a further 18% among other investors including Dragon executives. Mettoy has an option to buy back up to a 35% share until 1985. It was this cash injection announced in November 1982, which launched the Dragon from its Welsh lair on to a well-prepared public.

"The Tandy Colour ... has improved now, but I suspect one of the reasons is that they have looked under our cover."

When I arrived at Dragon's new premises between the hills and the sea, the permanent signboards had yet to be delivered, but the security compound was in the process of enlargement. Was he especially concerned with security, I asked Richard Wadman.

"I think there's always a certain amount in this business of wanting to know what the opposition's doing," he said. "It's better to be safe than sorry. We are developing new machines, and some of those machines do, we hope, have unique features – features which tend to last only a short time in this market, therefore any time advantage one can get is useful. It seems silly to announce your product to the world when you haven't yet made it. Perhaps I get a bit obsessed about it as a former security man."

Comic situations

This can make for some comic situations as Wadman and Clarke return from business trips to prospective export customers and touch down at the Kenfig offices, where, as befits a company expanding at Dragon's speed, there will be new faces among the staff. A greeting of "Who the hell are you?," says Wadman, may well be returned in kind: the lack of acquaintance between director and new employee being mutual in a company where relations at all levels are conducted on first name terms.

There is little difficulty with assembly labour in South Wales, where the run-down of steel and coal has left a void of employment. A few have come from the Japanese-owned TV factories; most of the middle management seems to be local, though for designer and engineering jobs Dragon looks for talent from all over Britain. The sad fact about electronic engineering construction is that it does not create many direct jobs: the company's staff numbers only around 60 people all-in.

Few of those staff can have had such a chequered career as Richard Wadman. I asked him how he had come to be sales and marketing director for Dragon after being, like George Orwell, a colonial policeman.

"I was an academic at the time, taking a rest from industry when I was approached by Mettoy as a consultant in 1981 for this computer project. Before that I had been a lecturer in statistics at Swansea with special responsibility for teaching statistical computing. Because of the bias of computer science departments, which tends to be much more towards theoretical applications on large systems, statistics departments tend to have a fairly large service element in their work; it is necessary to teach large numbers of social scientists, natural scientists, even pure scientists statistics, and to do that, first you need to teach them how to use a computer because very little in the way of large-scale statistics can be done without the use of a machine.

"My discipline is actually statistics, but I was previously a psychologist. I've also been a businessman, in the record industry. After the army, I went straight into the colonial police, and then into the

security business, which was an obvious spin-off, in Africa. That required me to handle a number of electronic items and that business grew from straightforward security into tape recorders and more general consumer electronics. Then, because there was an obvious link, in Africa anyway, on to the record industry. Our activities covered Malawi, Zambia, Kenya, Uganda, Tanzania, Zaire – in fact just about everywhere from the Rhodesian border upwards to the Sahara.

Record industry

"I was on the business side of the record industry, but I also trained as a recording engineer because I found it necessary. It started off as a glorified A & R (artists and repertoire) job, getting the artists; it then became a sales and marketing job, promoting the material; at the same time there was the hardware side of the business, which included at one end of the range, small computers.

"Most of my activities were in central Africa rather than west Africa, of which I'm not over-fond. It's a very difficult place to live in. You've got to be on your toes, not only to live there, but also insofar as business is concerned; things change rather rapidly. Business there is not dominated by large interests. Most of the large organizations do of course have interests in some form, or they are the remnants of the old colonial trading companies. But the majority of business is still done through smallish outlets run by families of Asian or Lebanese origin, and they tend to be very good businessmen, not easy to deal with."

What, then, of the indigenization policies which have been put into effect by Africa's independent black states? "All right, now you will see that Zambia's Zambianization has taken place and everybody has an African marketing and managing director, but you'll find that the man who really runs the company is Mr. Patel, who has moved to a back office and supplies all the expertise and is reponsible for the bottom line when it comes to buying and selling anything."

Wadman is deprecatory about his own varied achievements but states firmly: "One of the essential requirements of any computer company that is starting off is an individual who can cover a large number of areas. So I've been covering hardware, software sales and marketing."

However, it was coincidental that his areas of expertise coincided with those needed by Mettoy in 1981. Wadman had actually retired temporarily from business when he came to Swansea in 1973. Swansea, whatever other delights it offers, is certainly not known by its natives for its climate's tendency to induce sunburn. "It was a nice quiet part of the world. Basically, when I decided, for various reasons, to leave Africa, it was getting a bit hot there, to put it mildly... (pauses briefly) and I don't mean the sun."

The trouble with a clean sheet of paper is that there is a temptation to doodle rather than design.

Richard Wadman: "there are a lot of nice things about anarchy."

The Port Talbot Production Line. Dragon predicts that it will sell 400,000 by the end of 1983.

"I decided that, as I was back here, I would make up my mind to do something."

Essential discipline

Wadman set his mind to learning more about statistics, which he had discovered was an essential discipline to master when studying psychology. "Nearly all the statistical techniques in standard use were developed by psychologists because they have data analysis problems that are unique. Psychology has always been in search of a scientific basis to be acceptable, and the way this has come about is through statistical analysis. Anyone who is a psychoanalyst nowadays – even a behaviourist – is moving towards statistical analysis to justify the results of what he is doing."

Did he believe the human psyche to be amenable to statistical analysis? "An individual one – no. Probably not... (long pause)... as a group – yes."

Wadman moved straight on from learning to teaching at Swansea. It was eight years after leaving Africa that Wadman fell in with Dragon. What attracted him apparently comfortably set as an academic, to change career again and throw in his hand with a speculative venture such as launching a new microcomputer from scratch? "I felt I had some special expertise in this area because it had a lot of similarities with the other consumer electronics areas such as records and hi-fi. And by that time I'd added a further string to my bow in the form of a certain computer expertise. Statistical computingdemands the production of some quite impressive pieces of software, and that is my particular area."

"My main languages were for mainframe use – Fortran, then Pascal, APR, and various machine and assembler codes. As we moved to the smaller machines of course we started to encounter BASIC."

"I'm firmly convinced – and that's why I'm here – that the micro is something special. It is not just a smaller mainframe computer. It has a capacity for introducing change far greater than that bought about by mainframes."

What changes did he see the micro bringing about? In education and household control, among others. Wadman says the advantage of the home micro is that "people can invest their time and effort into finding out how they work; over a period of time we will end up with a wide base of educated users who can squeeze everything from their micro till the pips squeak. Out of this base are going to come applications that no one has even thought about yet."

Data systems

"Programming is a useful skill in itself, it is useful in an educational sense, other than in understanding the way these machines operate," though the latter does come in useful when the individual needs to get some insight into the way large data systems work, the sort of data systems which increasingly administer his daily business.

"The obvious place to move computers out into is first junior schools where the scientific structure of the schools is less rigid, that is where the real flowering of computer youth will come from, because children tend to be much more flexible than their teachers. In English language and geography computers can be used to good effect, and not for rote learning. Computers can power your imagination as much as they train you in the rote arithmetic." Yet research and development into productive and enjoyable uses of the micro is small compared with that allocated to commercial business and entertainment."

"This is one of the reasons for home computers," says Wadman. Maths is horror homework for most parents; if a computer can more reliably help the kids with it than they can, let them do it by computer. "There is this feeling in the

Dragon's financial wizzard, Tony Clarke.

home that something extra is needed. This is the reason the children are really driving this market. They feel the need for it, they will find other applications for it and it does expand their mind. It tidies the mind, compels you to break things down into a set of logical steps."

Algorithmic thinking is effective and useful in many other areas of experience? Yes, says Wadman – it helps to acquire the knowledge base, and ability to sort that knowledge base – which informs the individual's life. "Much of school training is in the acquisition and utilization of a set of knowledge that's being presented to you either from teacher's textbooks or wherever. If you can assess and acquire that knowledge in an efficient fashion, then the ability to step beyond that knowledge is going to come faster."

"I think the task of edcuation is to train you to be able to assess a situation which is about to occur in the future."

junior schools are... "where the real flowering of computer youth will come from".

Priesthoods

Wadman criticizes the British educational approach to computers for being too rigid and maths dominated and believes that ultimately such a system tends to foster the myth of the programmer as priest – running directly counter to the enfranchising effect which, he claims, broad computer literacy can bring. He reserves a particular dislike for priesthoods or 'canals' of any kind. "One of the advantages of the home micro is that it may get rid of the idea that we need a central data processing system altogether; in other words, if asked 'Do I want government decentralised?', my answer is yes...there are a lot of nice things about anarchy."

"It's nothing to do with the political flavour of the government, but most central governments are a thing we could well do without. If that bureaucracy is broken up, or better disposed of altogether, and moved out closer to the people it's intended to serve, then the need for large data processing systems disappears."

Communications are clearly a vital factor in a political scenario where the micro is the citizen's first line of defence against secrecy, and the telephone network should be considered the first stand-by, though as the Russian authorities' reduction of the trunk call network from Moscow proved, it can easily be throttled. Wadman is only lukewarm about Prestel which is complicated by its own machine operating system and hampered by the presentation of text in a 40x20 screen designed for the resolution of poor-quality home TVs rather than microcomputer monitors, but concedes that it makes sense to link together two items that people already possess, the telephone and the TV. It does not make me feel all that sanguine that Dragon would soon market a Prestel adaptor, as they say they will.

Nor does he believe teletext to be the complete answer but, he says, you've got to go with what you've got and know that you're going to have to update. "I don't believe that computers become obsolete, it's that people's requirements of the computer change. If the machine does well the job you ask it to do now it will do the same in ten years' time. But your requirements may have changed."

Let us hope that the former proposition is true of the Dragon 32, and of such successors as we expect from it by the end of 1984.

IF YOU'D LIKE TO KNOW MORE...

The *Profile On ...* series is designed to provide newcomers to microcomputing with the background information on hardware companies that only the old timers in the micro world have accumulated. If you're in the buying position at the moment we aim to provide an idea of the pedigree and marketing strategies of the big names; details that won't come out in the sales talk.

In recent months *Martin Hayman* has also been behind the closed doors of *Tandy* (May '83), *Apple* (April '83), *Acorn* (March '83) and *Osborne* (February '83).

Next month ACT Sirius will stand in the spot light. Back issues are available from the editorial address at £1.25 (inc. p&p).

HUMPHREY WALWYN'S **'LOGICALLY-SO' STORIES**

AMOS THE FIRST

IN THE BEGINNING

Best Beloved, computers were a novelty. They were large and heavy and awkward and consumed considerable quantities of electricity. They couldn't be left on for long periods because the electrical heat burnt holes in table tops. (Yes, Best Beloved, even some *modern* computers are useful leg warmers if you compute with the box on your knees.) Ancient computers emanated waves of electro-interference causing iggly-squiggly lines on television sets up to three hundred yards away. Neighbouring radios and hi-fi units would be drowned with high-pitched whines. And the interference worked in both directions. Olde-worlde computers were exceedingly shy and temperamental. Passing milk-floats would create innumerable bugs. Washing machines and vacuum cleaners caused havoc within the central ROM. Thunderstorms made your programs land upside down like rows of bats sheltering in damp caves. It was all rather depressing, but people persevered because computers were *new*. They were exciting objects *because* they were new and so everyone who saw a computer was very impressed. This was the main reason why home computers took off at all, Best Beloved. The only way to get on in the world, amaze your friends or impress influential people was to own a home computer.

"Gosh!" visitors would remark, with a hint of horror mixed with adulation, "You mean *that's* a computer? I didn't think they looked like *that*..."

It really didn't matter what you *did* with it once you'd got it, Best Beloved, you simply had to show people that you had one. You would then be marked down as an individual with exciting and progressive thoughts... a forerunner of a new generation! (Oh, yes, it was *easy* in those days, Best Beloved.)

Compared to the machines of today, the first home computers were slow, and limited in memory and applications. But they were *not* stupid, Best Beloved. If was just that people didn't really know what to do with them. You might have wondered what happened to redundant computers. On the other hand, you might not. Either way, this story goes some way to explain why 'Newest, Latest, Up-to-datest' is not necessarily 'Best'...

HUMPHREY WALWYN'S 'LOGICALLY-SO' STORIES

Amos sat on the shelf. He had become used to the fact that no one appeared to want him. He had become resigned to a lifetime of boredom and obsolescent idleness. For a computer – any computer – this was a personal tragedy. He had been designed to be useful and a positive help to mankind. It wasn't *his* fault that times had passed him by. It was very unfair. He glowed heatedly and angrily at the thought of such injustice. It was all the fault of Abakus Systems.

Amos was one of the very first computers designed by Abakus for the home market. He was invented before Bmos and Cmos were even thought of. At the time of his conception, he was a miracle – a marvel of the 1970s. The World hailed his arrival with a smattering of 72 point headlines... "The year 2000 available today!"... "Science-Fiction becomes a Reality"... "Computer take-over in your home – Shock-Horror". Other Amoses appeared on the television chat shows and lecture room desks and helped spread the good news of 'new-tek'. But the joyride didn't last. Hardly anyone knew what to do with the thing. The small company which had spawned the creation – Abakus Systems – moved rapidly onto further discoveries with greater potential. The original Amos just *wasn't* marketable. Amos was so *limited*, Best Beloved. He only had 2.2K bytes of RAM ("...holds more than two *thousand* characters of information inside" – so spake the original publicity leaflet) and had a very limited amount of specialised home computing software. The first home computers were sold for practical users in their homes – an extraordinary idea. So software was designed for *really* useful things like 'Controlling Central Heating', and 'Controlling the humidity and local environment within terrariums for stick-insects' and 'Calculating the amounts of sugar required in home-winemaking' and '128 useful recipes with liver and onions'. Yes, *really* useful programs which all the early programmers at Abakus Systems reckoned were exactly what the average potential home computer user would want.

Well, they were wrong, weren't they, Best Beloved! Home-winemaking enthusiasts preferred to use their own eyes and noses rather than trust a computer to ruin their brew for them. Liver and onions may have been nice for lunch, but they didn't need 128 computerised recipes. Only three copies of the stick-insect humidity program were sold... one to a delicatessen by mistake, two to the London Zoo Insect house. And since, by then, the scientists at Abakus were losing interest in Amos, nobody ever got around to designing the necessary central-heating interface equipment. So Amos got left on the shelf, and the years moved on while Abakus Systems grew from a tiny enterprise to a large and successful multi-national computer organisation.

Poor old Amos... stuck in a computer shop and constantly reminded of his failure to progress. Younger, newer computers came and went. Still youngerer and newerer and zappier computers arrived. Everyone wanted to buy *them*! Amos sat and collected dust in his now useless interface ports. The conversation at night between all the other equipment in the shop was very hard for him to bear.

"Hi, Old Timer!" shouted a 32K spritely little keyboard.

Amos ignored it.

"Oh, don't waste time talking to *him*", said a gleaming 16-bit office machine. "He's been here so long, he's virtually part of the shop wall!"

A small 200 megabyte disk-drive chipped in:

"What's more, he's so *slow* he can't fully undertsand what we're saying. CAN YOU, OLD AMOS?"

If there was one thing that really got up Amos' user port, it was the condescending way the new machines would slowly spell out DATA to him.

"OK, so you think you know it all", he hummed, "but I was here first. I've seen so many of you come in and go out. You may be new today but no-one will want to know about you in a year's time and then you'll be just like *me*. Unwanted, uncommercial and doomed to redundancy."

"Don't listen to him," said a flashy young portable micro, "Amos is just a has-been, a computer dinosaur. *We're* what the world wants nowadays... its US who have the best software for the home user. We've got chess programs, space game programs, adventure games, tank battles... everything that the modern household wishes to buy... you name it, *we* can run it."

A neat 48K machine giggled in the corner:

"Hey, do you all know what Amos runs?"

Amos subsided in embarrassment as the whole shop hung up in eager anticipation.

"You'll never believe this," smirked the 48K unit. "He's programmed for controlling domestic central-heating and listing liver and onion recipes!"

And all the machines glitched in helpless laughter. A daisy wheel printer had to restrain itself from falling off the shelf from too much mirth. It was very funny indeed. And when the details emerged about the humidity of environmental control for stick insects, a 98K graphics display computer blew a fuse and had to be fanned with cool air.

Amos just sat there. There really was nothing he could do. Every night this sort of thing went on and the only crumb of comfort to him was the thought that the following day might see someone in the shop who wanted to buy him. That was the only way out. Either that, or being 'returned to the factory' for melting down and destruction.

A gloomy prospect, Best Beloved. But, far away, events were turning which would change his fortunes.

The Home Computer Business was now a major industry. In Amos's day, computers were invented and nurtured in garden sheds by intrepid teams of computerologists slaving for a dawn of a 'New Age' in their spare time. (Sounds pretty romantic doesn't it, Best Beloved? In point of fact, that's almost exactly what happened.)

However, when computers came of age and important business executives became hooked on 'Space Invaders', computerologists came in from the cold and relative obscurity of the garden and sat in gleaming white garage blocks... rows and rows of programmers and terminals, lawyers and accountants and packers and polystyrene foam and printers and peripherals. Abakus Systems had become so large and successful that they now owned half of New York, the Q.E.2., General Motors and three Greek islands. In addition to computers and computer games, Abakus had diversified into other manufacturing areas... washing machines, speed boats and golf trolleys. They were a big firm with big interests and ambitions, and the Controller was a *very* important man.

"Good morning!" he said to his assembled staff.

"Good morning, Sir!" they answered dutifully – a positively deafening roar of greeting from the thousands of massed employees hunched over their hot V.D.Us as they dreamed up further flights of fancy for an ever hungry software world.

The Controller was feeling in an uncontrollably benign mood today. Why not? Everything was going well, business was booming and the company was so well digitalized that even the quality check computers got bored – they had nothing to do since everything was so perfect. The only computers that worked over-time were those involved in stock control – the order books were humming with activity. The Controller looked out of the window, stretched his legs out over a large Controller's desk and learned back in his padded Controller's chair. He glanced across the four hundred foot Controller's office and nodded at his assistant.

"Well, it's gonna be another nice day."

The assistant leaned forward to catch the words of Controlling wisdom:

"Sorry sir, did you say something?"

(I *said* it was a *big* office, Best Beloved.)

The Controller controlled himself. He raised his voice:

"I was saying that there ain't much wrong with the world. Abakus Systems is a major success story. In fact, we are so successful it's gotten to be a little boring around here."

The Controller fiddled with an executive desk-top model oil-tanker – Abakus were always keen to diversify into new areas, Best Beloved. The assistant coughed and shouted across the cavernous office:

"We could always show people how clever we are. Why don't we stage an exhibition of the total wonderfulness of your controlling mightiness at Abakus Systems?"

The Controller's eyes turned to liquid crystal. The emotion of the moment was too much for him.

"You mean an exhibition? Yes, a display of the very first computers we made and the very latest in Abakus technology?

More than that! How about a museum? A permanent showcase of the best in new-tek hardware... a monument to our creative energies... an impressive demonstration of Abakus' contribution to a brave new world... a temple where the world can worship and marvel at my controlling excellence?"

(The Controller sometimes got carried away with ideas, Best Beloved.)

The assistant nodded enthusiastically.

"Oh yes, sir! What a wonderful idea! How clever you are to have thought of it!"

(To be a *successful* assistant to a Controller involved debasing one's personal moral fibre. The ideal candidate for the job would have been a sycophantic slimy toad, Best Beloved.)

The Controller basked in the reflective glow of his own excellence:

"We shall start right away. This project has immediate priority. The museum will have to cover the entire history of computers. Where and when did Abakus start?"

The assistant removed a file of papers from his briefcase.

"I have it all here, sir. Of course, it was *way* before your time and a lot of mistakes were made. The world's first home computer was built by Abakus in a disused grocery store. It was called Amos and only had 2.2K RAM but it was the *first*. And Abakus was *in* there, sir!"

"Well *find* it, man! If it was the first, then it must have pride of place in my museum."

The assistant retreated hurriedly.

And so was born the Abakus Museum of 'Modern Operanda' – or AMMO for short, Best Beloved.

It was difficult to find an original Amos computer. No one had one, nobody could remember much about it and most people had never heard of the name. But, eventually, after telexes and telephone calls, one Amos was discovered in *working condition* in a small computer shop... covered in dust and abandoned on a shelf and half hidden behind more modern products..., but still a genuine Amos. Indeed our very own Amos, Best Beloved.

Amos' life changed immediately. The shock of becoming an overnight celebrity nearly blew his ROM and the other equipment in the computer shop became strangely quiet and – almost reverential. What? Old Amos? A star in their midst? Really?

Amos glowed quietly. Encased in a glass frame, he sat on display. He was now far from the noise and clamour of shops, offices and activities. He was in pride of place in a large marbled hall of fame surrounded by subdued murmurs and gasps of astonishment from admiring crowds. ("Golly Gosh! Look Dad, only 2.2K RAM! Isn't it *huge for such a small amount of memory? Crikey, you mean it was the very first* one? Wow!" etc.)

The only thing missing was the software. The assistant to the Controller had discovered the four main programs for Amos in an old cardboard box, but when he looked at them ('Central Heating', 'Stick Insects', 'Sugar in Winemaking' and 'Liver and Onions') he was sure they would be an embarrassment to Abakus Systems. (To have invented the first computer was *one* thing, but to have invented such bizarre programs to run on it was *quite* another thing, Best beloved.) So he hid them in a bottom drawer.

"Where is the software for Amos?" shouted the Controller. "We've got the machine, but all it does is sit idle in a glass cage. If Abakus invented it, then it must be shown to *work*!"

The assistant slid unctuously across the carpet.

"Well, sir, er, I, um..."

"Speak up, man. I won't be able to control myself for much longer."

The Controller was obviously upset. The assistant shuffled nervously from one foot to the other.

"Of course, sir, you weren't with the company at that time and I'm afraid the programs were not very good. In fact they were pretty lousy programs."

"OK! OK! But what were they *about*, man?"

"Well, sir, they wrote a little program about kitchen recipes and another one about controlling domestic central heating and..."

"What sort of kitchen recipes?"

"Um, liver and onions, sir."

"Great! Fantastic! Amazing! What an idea! I love liver and onions."

The assistant paused in startled disbelief.

"Oh, you do, sir? Well, it's rather a good little program really."

"Yes, it is. And we shall adapt all the programs for use on our modern machines. Every home will have a copy. What a treasure trove of talent and value I have found here!"

And so, Abakus Systems bought up a meat packaging firm and distributed 'Oven fresh frozen Liver with Onion' food packs to go with their liver and onions software. They manufactured special hardware to control central heating in the home. They bought a controlling share in the largest 'Home-winemaking kit' manufacturer and bred millions and trillions of stick insects in a new factory. Diversity was, after all, important to Abakus. So, too, was making money. And Abakus Systems got very rich *indeed*, Best Beloved. And every household made wine, switched central heating on and off, served 128 different meals with liver and onions and kept stick insects 'for fun and profit'. (The only profit was Abakus', Best Beloved, but then they were *very* good at marketing!) And the World became a subsidiary company owned by Abakus Universe Systems.

All of which goes to prove a number of things, Best Beloved.

Firstly, old computers don't always die. And antique computers may be quite useful. Before you jettison your old model, phone a local museum.

Secondly, many so called 'new' programs aren't 'new' at all. They're simply *new* versions of old ideas. It's hard to be completely original in the Micro-Computer Business.

Thirdly, no matter how specialised or daft your own software ideas are, everyone will want programs about stick insects if your marketing is good enough.

Lastly, Very Important People – such as Controllers – may have Very Important Jobs but they are surprisingly unadventurous in their eating habits.

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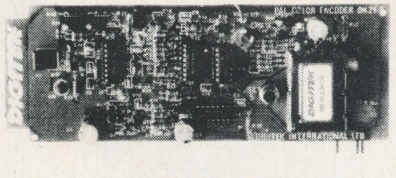

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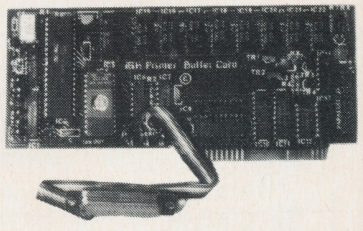

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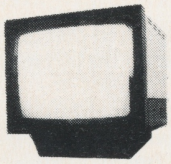

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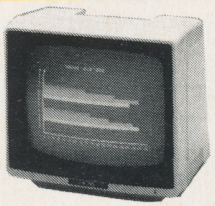

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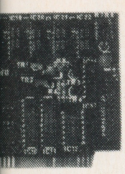

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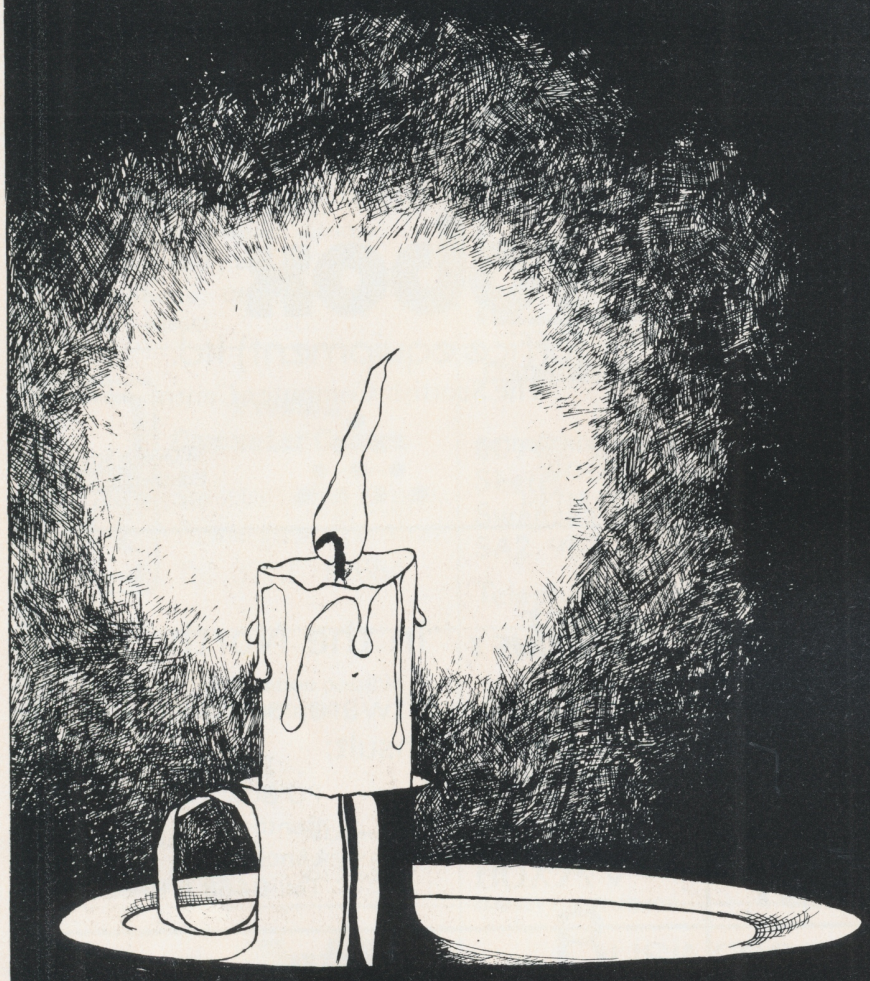

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Every month we write this magazine with the newcomer in mind. Our aim is to bring you to an understanding of the micro world as painlessly and as speedily as possible. Nonetheless, we are the first to agree that there's a certain 'minimum knowledge' barrier which, if you don't know the jargon, can prohibit a full understanding of our regular masterpieces.

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